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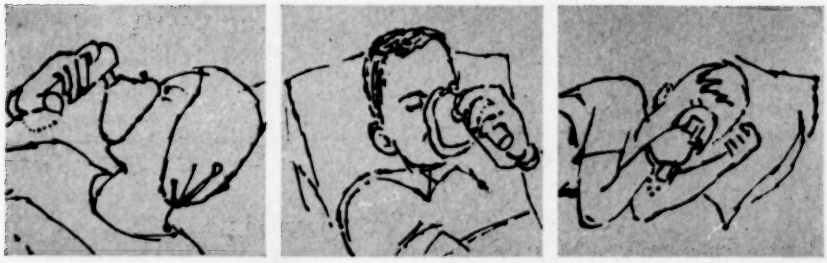

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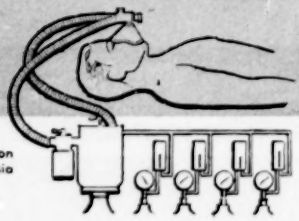


CARDIAC ARREST— PREVENTION, DIAGNOSIS AND TREATMENT

The following is an abstract of an article by William H. L. Dornette, M.D., Professor of Anesthesiology, University of Tennessee, Memphis.

After defining cardiac arrest as a "cessation of effective circulation," the author discusses its causes, prevention, diagnosis and treatment.

CAUSES: Cardiac arrest is caused basically by respiratory (lack of oxygen and/or excess carbon dioxide in the alveoli) or cardiovascular factors. The author describes several situations which commonly bring about cardiac arrest.

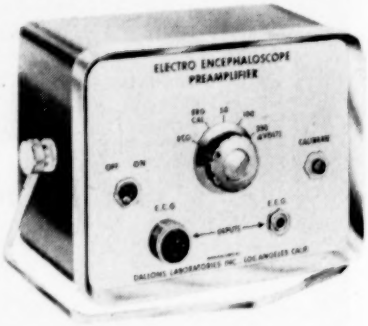
PREVENTION: Signs and symptoms of impending arrest are discussed and the author describes various apparatus used to detect these signs, mainly the electrocardiographic monitor. Normal and abnormal patterns as they appear on apparatus screens are illustrated and audio monitoring described. Prevention is obviously the best treatment.

DIAGNOSIS: The ability to instantly detect cardiac asystole or ventricular fibrillation is a most important function of an electrocardiographic monitor. Correct interpretation of audio and visual monitors by the operating room team is vital.

TREATMENT: Successful treatment of cardiac arrest depends on early recognition and immediate institution of definite therapy. Both the surgeon and anesthesiologist are needed and must act quickly.

The author concludes by emphasizing the vital role played by the anesthesiologist in prevention, diagnosis and treatment of cardiac arrest. He mentions the Dallons Cardioscope as a recommended unit for observing the patient's electrocardiographic status.

The complete article is available on request. Please write Ohio Chemical & Surgical Equipment Co., 1400 E. Washington Ave., Madison 10, Wis. — Dept. ANA-2.



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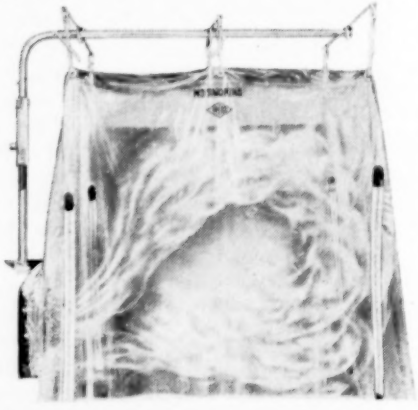

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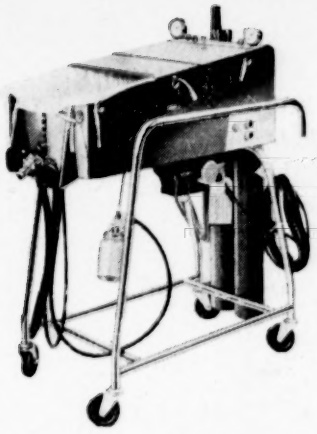

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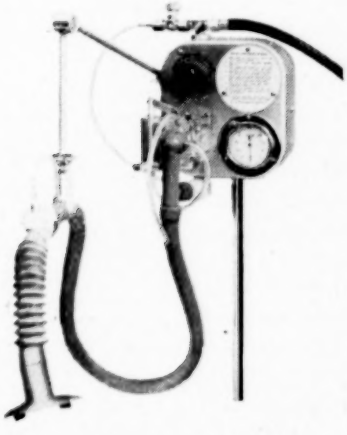

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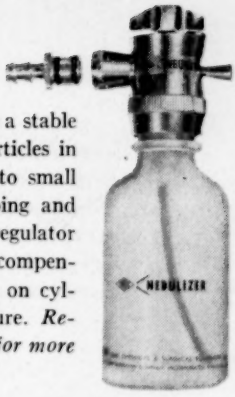

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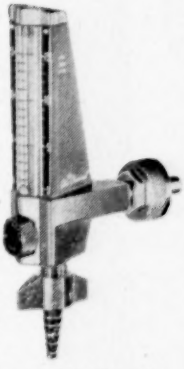

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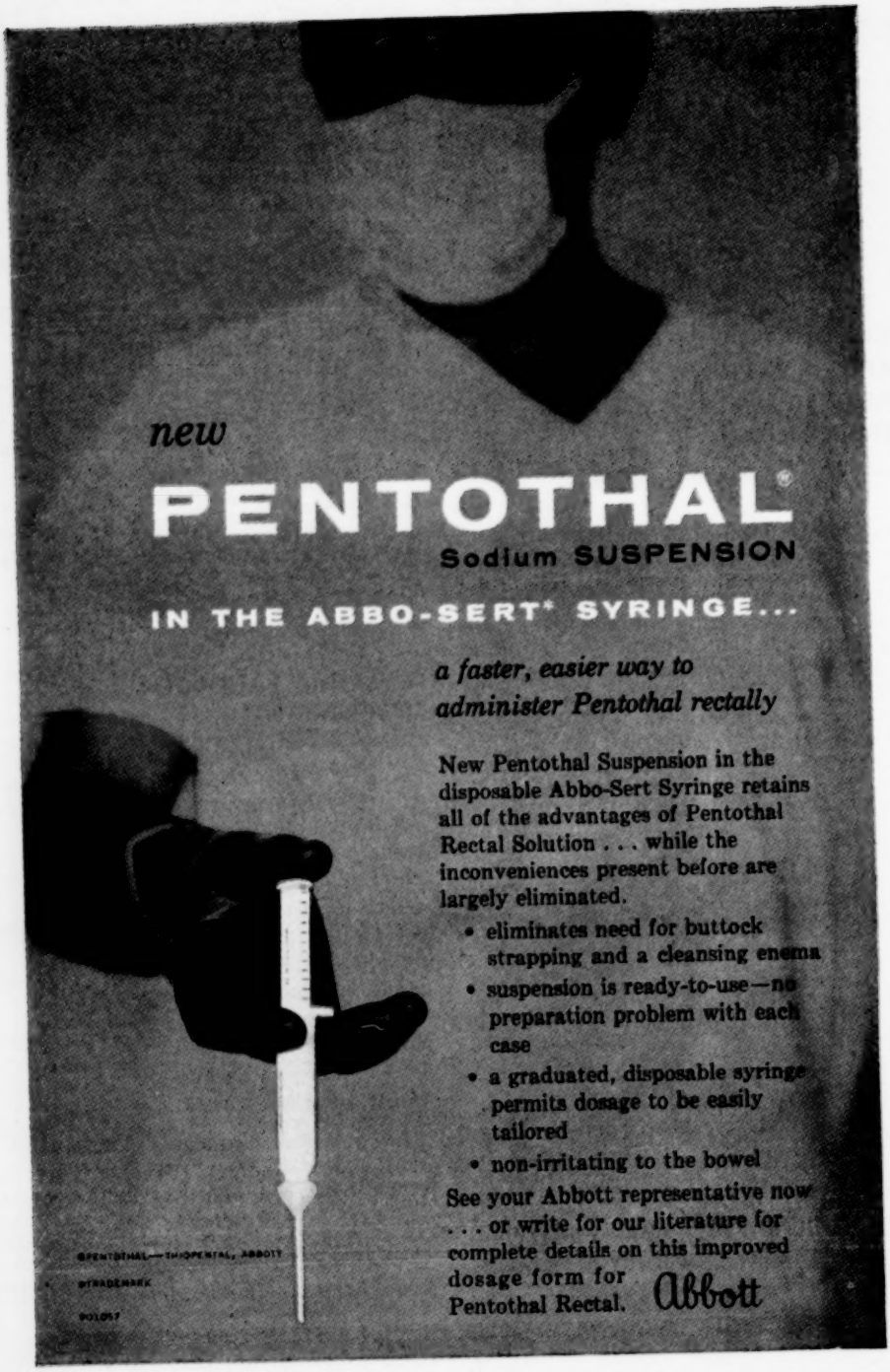
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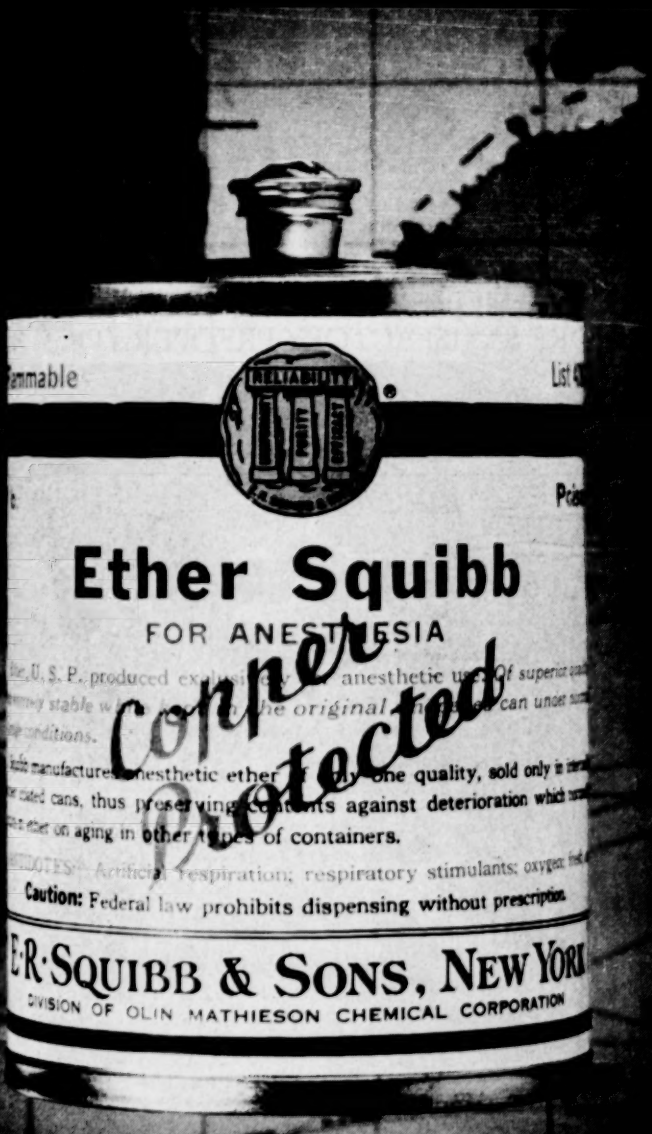

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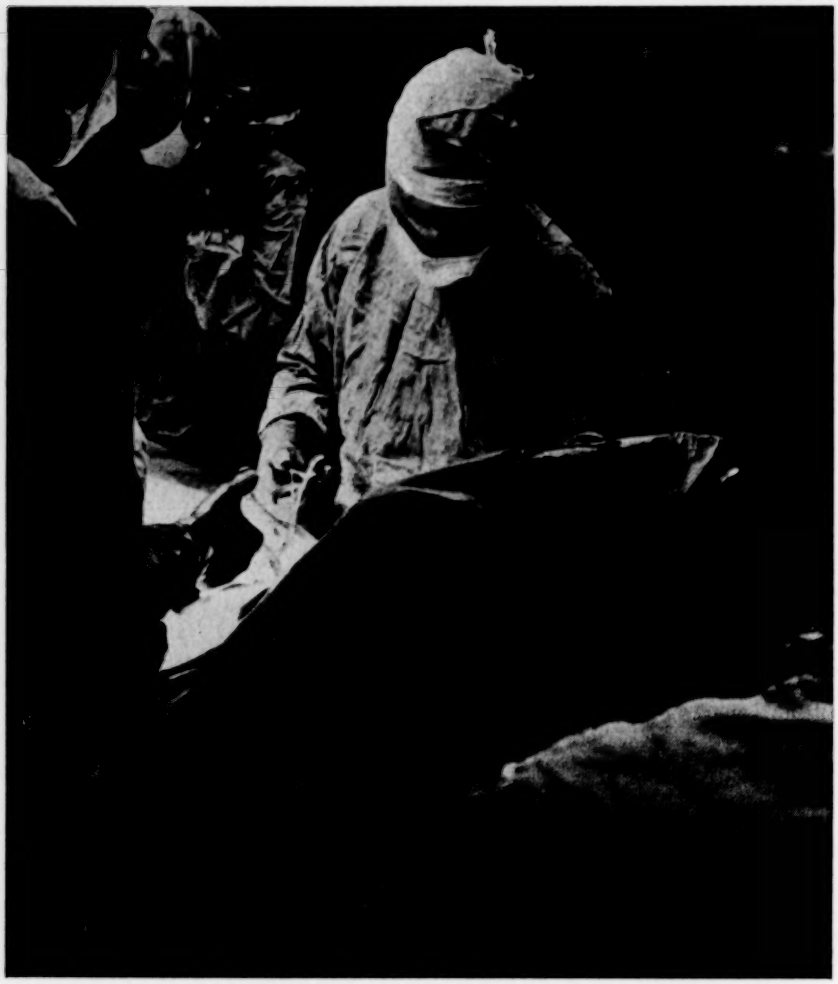

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Spinal Anesthesia: Complications and Contraindications
Part I

John Adriani, M.D.*
New Orleans, Louisiana

The individual who oversees a spinal anesthetic has a responsible task. The first quarter hour following the injection of the drug is the most critical period of a spinal anesthetic. Most mishaps due to spinal anesthesia occur during this time. Fatalities caused directly by spinal anesthesia are due to: (1) Abrupt or uncontrollable circulatory failure and (2) respiratory paralysis due to ascent of the drug into the cervical and thoracic segments. Aspiration of vomitus, overdosage of supplemental drugs or respiratory obstruction resulting from supplemental basal narcosis or anesthesia may also cause difficulties. Deaths from all these causes are preventable. The spinal anesthetist, therefore, must be able to recognize and be familiar with the management of complications of spinal anesthesia. This cannot be done intelligently unless the anesthetist understands the physiological disturbances which occur during spinal anesthesia. Therefore, these will be described.

* From Department of Anesthesia, Charity Hospital and Departments of Surgery, Schools of Medicine, Louisiana State and Tulane Universities.

Presented at the Annual Meeting, American Association of Nurse Anesthetists, Chicago, August 20, 1958.

Effects of Autonomic and Somatic Denervation

Spinal anesthesia provides muscle relaxation which cannot be duplicated by any other method of anesthesia. Surgeons unfortunately often demand spinal anesthesia for the relaxation it affords without regard to the patient's ability to withstand the disturbances in physiology caused by the block. More occurs during spinal anesthesia than the readily apparent loss of sensation and muscle paralysis.

Spinal anesthesia is classed as low, medium and high. Low spinal block extends up to the pelvis, a medium block to the xyphoid and a high one above the xyphoid. In high spinal anesthesia, there is a complete blockade of the sensory and motor fibers in the sacral, lumbar and the lower thoracic segments. The autonomic fibers, however, are not all blocked. The sympathetic and parasympathetic components of the autonomic nervous system originating from the lower spinal segments are inactivated. In the thoracic segments, however, the sympathetic fibers are blocked but the parasympathetic fibers, since they descend into the thorax and abdomen from the vagus nerves are not blocked. This partial denervation of

the autonomic nervous system in the upper part of the body and complete denervation in the lower part, coupled with the somatic nerve paralysis, causes significant physiologic disturbances in unoperated individuals.

The disturbances are even more complex and unpredictable when the blockade is complicated by trauma, blood loss, traction reflexes and other effects of surgery. Mechanisms which compensate for these changes may be obtunded or inactivated by disease. The disturbances, therefore, are often enhanced by diseases complicating the surgical disease. Some of the physiologic disturbances are of clinical significance; others are merely of academic interest.

Effects Upon Circulatory System

Of all changes which occur, those affecting the circulatory system are the most important. A hypotension commonly develops during a spinal block. One can neither predict its occurrence nor its severity, since so many variable factors are involved in causing it. Certain characteristics differentiate the hypotension from that caused by trauma, blood loss or reflex activity. As a rule, it develops shortly after induction of anesthesia, usually as soon as sensory loss is apparent. It increases in severity as the motor effects are established. The systolic blood pressure falls; the diastolic is usually well maintained or falls slightly unless the physiologic disturbances are severe. The fall is not as pronounced as the systolic. The pulse pressure is decreased. A bradycardia develops particularly if preanesthetic medication is omitted and if the spinal is high. Morphine, scopolamine and atropine mask the bradycardia.

The circulatory derangement is peripheral, that is, it is in the arterioles and capillaries, rather than central. The fairly well maintained diastolic, the lowered systolic pressure, the bradycardia and the diminished pulse pressure indicate a decrease in cardiac stroke volume without appreciable change in peripheral resistance. Measurements of cardiac output show that it is decreased. Circulation time is prolonged; in some cases it is twice as long. The arterial blood oxygen saturation remains unchanged but the venous blood oxygen content is reduced. The arteriovenous oxygen difference is widened. This is additional evidence that there is slowing of the blood peripherally and a possible local tissue anoxia. Blood carbon dioxide content and serum carbon dioxide combining power are unchanged.

It was once believed that the hypotension was caused entirely by the blockade of sympathetic fibers which in turn caused arteriolar dilatation and pooling of blood. This is only part of the answer. Arteriolar dilatation and pooling of blood do occur but are confined to the peripheral vessels. This is evidenced by an increase in skin temperature, the absence of sweating, and an increase in the blood volume of the extremities in the anesthetized areas. The splanchnic vessels and vessels of the other viscera do not dilate as a result of the sympathetic paralysis because there is an intrinsic autonomous control in the arterioles which maintains vascular tone. A generalized dilatation of the entire vascular bed would cause a reduction of peripheral resistance. A marked reduction in peripheral resistance would be manifested by a lowering of the diastolic blood pres-

sure. This does not occur, however. The reduction in diastolic pressure during spinal anesthesia is slight, therefore, there is no generalized widespread vasodilatation in the viscera. Pooling of the blood in the peripheral vessels and in the spleen, which dilates two or three times its normal size, contributes to approximately 10 per cent of the lowering of blood pressure.

One of the more important factors in causing the hypotension is the decrease in venous return to the heart. Return of venous blood depends upon three factors: (1) The support and "milking" action of skeletal muscles upon the veins, (2) variations in the intra-abdominal pressure which helps to propel the blood along in the abdominal veins to the thorax and (3) variations in intra-thoracic pressure which cause a negative pressure to develop in the great veins and bring the blood to the heart. The heart does not draw blood toward it. It merely pumps that which is brought to it. During spinal anesthesia, the skeletal muscles are relaxed and the return of blood to the heart is decreased due to relaxation of the muscles. As the number of spinal segments anesthetized is increased, a greater mass of muscle tissue is denervated. The stagnation of blood in the vessels of the muscles is increased proportionately. In addition, in high spinal anesthesia, the thoracic movements are decreased due to paralysis of the lower intercostal muscles. Hypotension, therefore, depends largely upon the level of distribution and the intensity of anesthesia.

Intensity of Anesthesia

Intensity of anesthesia refers to the completeness of the block. There is a certain minimum concentration which causes a blockade of all fibers, sensory, motor and autonomic in a mixed nerve. Below this minimum, the motor fibers are not blocked, since they are the larger fibers. The concentration of drug, therefore, may be reduced to a point which causes a blockade of sensory fibers only with no motor paralysis. The greater the number of fibers blocked in a mixed nerve, the greater the intensity of anesthesia. In upper abdominal surgery, the dose of drug used must be sufficient to block the motor fibers emanating from the lower thoracic segments if the upper abdominal muscles are to be relaxed. This concentration is more than that necessary to cause a complete blockade of all fibers in the lower abdomen. In the upper abdomen and lower thorax there is a gradual diminishing of intensity of anesthesia because the solution bathing these segments is more dilute. An area is reached in the midthorax in which the changes are only sensory and autonomic. Dosage, therefore, plays a role in causing circulatory derangements. As the dose is increased and more of the cord is completely paralyzed the loss of motor activity is more widespread.

The hypotension is often ascribed to toxicity of the drug, particularly when long lasting drugs, when drugs such as tetracaine (Pontocaine) and dibucaine (Nupercaine) are used. Actually it is intensity of anesthesia which is responsible. The hypotension is just as severe with the short acting drugs, like procaine, as with the long lasting when intensity and extent of anesthesia are the same and when comparable doses are used. With the longer lasting drugs the difficulties last a longer period of time.

Management of Hypotension

The hypotension incorrectly is referred to as "spinal shock". It differs in many respects from shock caused by trauma, hemorrhage or fluid loss. In spinal anesthesia, the hypotension is neurogenic in origin. Blood volume, at the onset, is not appreciably lowered. Venous pressure is lowered in the peripheral veins. Hemoconcentration does not occur. The hematocrit is not significantly altered. The size of the vascular bed is increased so that a disparity exists between it and the effective blood volume. In shock from trauma or hemorrhage, the cross sectional area of the vascular bed and the blood volume are both reduced. Vasopressor drugs readily correct the derangements caused by spinal anesthesia by decreasing the cross sectional area of the vascular bed. Fluids are ineffective, unless they are administered rapidly in large quantities. The reverse is true in hemorrhage and traumatic shock. The vasopressor used must be one with a sustained action, such as ephedrine, Neosynephrine or Vasoxyl. It must be given intravenously to be effective, if a hypotension has developed. Absorption from the subcutaneous tissues is too slow to be of benefit.

The hypotension of spinal anesthesia develops shortly after anesthesia is induced. Hypotension which develops after the operation has been in progress for some time, say an hour, is more apt to be due to the surgery or blood loss. It is corrected by the administration of fluids and does not, as a rule, respond to vasopressors.

Effect of Positional Changes

Hypotension is easily precipitated by positional changes because the compensatory mechanisms responsible for circulatory readjustments are disrupted. Care must be exercised in shifting positions or transporting patients from one locality to another. Since circulatory depression frequently follows shifting from the supine to the Trendelenburg, the lateral, the prone, and to other positions, patients should be moved with care or not shifted at all if possible.

The mechanisms responsible for circulatory readjustments are controlled by the autonomic and central nervous systems. They do not operate effectively during spinal anesthesia. Inhalation of carbon dioxide, which ordinarily causes the blood pressure to rise in unanesthetized subjects, has no effect upon the blood pressure during spinal anesthesia. Carbon dioxide should never be used. In the unanesthetized area the vessels are constricted. The skin is pale and the temperature is reduced. The vasoconstriction in this area is an indication of an attempt to overcome the hypotension in the areas without vasomotor control.

Contraindications to Spinal Anesthesia

Obviously an anesthetic procedure which affects the circulatory system, as does spinal anesthesia, may exert a more pronounced effect if cardiovascular diseases are present. Severe hypotension invariably occurs after induction of spinal anesthesia in patients who have cardiovascular diseases, anemia, shock, dehydration or blood loss. The hypotension is apt to appear abruptly in these subjects, is more severe and does not respond to vasopressors. The vasopressors, as a rule, are least effective when needed most.

Spinal anesthesia is best avoided when well defined myocardial disease is present, particularly if it is due to coronary sclerosis. The hypotensive episodes may initiate thrombosis or cause coronary insufficiency on the operating table. Low spinal anesthesia may be tolerated by patients with "mild" cardiac disease. High spinal anesthesia is best avoided when any cardiovascular disease is present. Patients with uncomplicated mild essential hypertension do well, as a rule. They respond to vasopressors. Such is not the case with hypotensive syndromes, however. Hypotension from any cause is a contraindication to spinal anesthesia.

Sympathectomized patients do not tolerate even mild hemorrhage. Spinal anesthesia is best avoided when bleeding is anticipated unless provisions are made for immediate, adequate blood replacement. Patients with increased intraabdominal tension from ascites, intestinal obstruction, marked gaseous distension, tumor masses of unusual size, or pregnancy develop severe hypotension promptly after induction of spinal anesthesia. The mechanisms causing it are not understood. Compression of the great veins in the abdomen with interference of the venous return from the extremities is the most likely cause. Septicemia is a contraindication to spinal anesthesia because of the possibility of contamination of the spinal canal with blood containing bacteria. Patients with neurological diseases, particularly those which involve the cord should not have spinal anesthesia. This is discussed further on.

Effects on Respiration

Spinal anesthesia affects respiration primarily by paralyzing the intercostal muscles and the diaphragm. The drug does not penetrate the medulla and paralyze the respiratory center, as is erroneously believed. Long before the drug passes into the fourth ventricle it has paralyzed the phrenic and intercostal nerves which paralyze the diaphragm and intercostals. The drug can be confined below the cervical area by proper positioning, that is, having the head up and sharply flexed when a heavier than spinal fluid (hyperbaric) solution is used or head down if a light (hypobaric) solution is used. As long as the phrenic nerves remain active the patient is able to use his diaphragm and maintain his own respiration. When the lower intercostals are paralyzed the diaphragm compensates for the decrease in ventilation by increasing its activity. The state of the intercostals and diaphragm may be determined by asking the patient to take a deep breath. Should the drug go too high the anesthetist breathes for the patient artificially using a bag and mask until the block wears off.

Metabolic Effects

Spinal anesthesia, uncomplicated by hypotension, has little effect on metabolic processes. Liver function and renal function are unaltered. Blood chemical changes such as variations in blood glucose, non-protein nitrogen, carbon dioxide combining power, and bleeding and clotting time do not occur. If a hypotension occurs and it is not corrected promptly, impairment of liver and kidney functions may occur.

Effects on the Stomach, Intestines

The effects of spinal anesthesia upon smooth muscle of the viscera

are worthy of note. The upper portion of the gastrointestinal tract, since it is innervated by the vagus, assumes a ribbon-like contracted appearance when anesthesia extends to the thoracic segments because there is a sympathetic blockade and the motor effects of the vagus predominate. This appeals to surgeons because it facilitates exploration.

Traction upon the mesenteries of the abdominal and pelvic viscera may cause discomfort because there is a retrograde transmission of impulses along the vagus or from one ganglia to the next in the sympathetic chains. In upper abdominal surgery particularly, patients complain of pain around the heart or beneath the upper part of the sternum. On occasions, traction on structures in the biliary tract or on the diaphragm causes pain in the shoulders. This is due to retrograde transmission of impulses along the phrenic nerves, which like the vagi are not inactivated by the spinal. Usually, supplemental anesthesia is necessary to overcome this discomfort.

Effects on the Uterus

The effects of spinal anesthesia upon the uterus depend upon which spinal segments are affected. Sensory fibers enter the uterus from the sacral and lower lumbar segments; the motor fibers from the thoracic segments. Contractions are not inhibited if the blockade is confined to the lower spinal segments. Blocking the autonomic fibers of the thoracic segments causes both the intensity and frequency of uterine contractions to diminish. The uterus does not relax during spinal anesthesia, but maintains its usual tone. Fetal blood oxygen and carbon dioxide content are not altered appreciably during spinal anesthesia, provided the blood pressure is maintained within normal limits.

Causes of Fatalities

It is obvious then that circulatory disturbances during spinal anesthesia cannot be disregarded. If untreated, cerebral anemia invariably develops. This is in turn followed by respiratory failure and cardiac arrest. The majority of fatalities which can be attributed directly to the spinal anesthetic result from this hypotension. Asphyxia due to ascent of the drug into the upper thoracic and cervical segments occurs far less frequently. Both complications may be averted by the proper selection of patients and exercising utmost care in inducing anesthesia. The pulse, respiration, and blood pressure must be carefully and constantly observed during anesthesia. Provisions for immediately instituting artificial respiration and overcoming circulatory collapse should be made before the spinal block is attempted. No spinal anesthetic should be induced without having a respirator of a satisfactory type immediately available. Idiosyncrasy to the drug, "toxic reactions", and other vague causes are responsible for few, if any, deaths.

Vomiting During Anesthesia

Nausea and vomiting during spinal anesthesia are not only annoying to the patient but also interfere with the operation and may cause drowning by aspiration if it is massive. There are a number of causes. Patients with a full stomach vomit regardless of the type of anesthesia used. Spinal anesthesia is no exception. Operation should be deferred if the patient has eaten. Such patients even though

awake cannot help themselves and aspirate. Fasting patients also develop nausea and vomiting but far less frequently. The causes are as follows: (1) Occasionally nausea and vomiting occur immediately after the solution is injected into the intrathecal space. Perhaps this is a reflex phenomenon which occurs when the drug comes into contact with the nervous elements and the meninges. (2) Nausea and vomiting often herald the onset of *hypotension*. Medullary anemia resulting from the circulatory depression activates the vomiting center. Yawning frequently precedes the vomiting. (3) *Vasopressor drugs* used to overcome the hypotension may precipitate and cause nausea or vomiting. Some patients respond to ephedrine, Neosynephrine or Vasoxyl in this manner. (4) *Traction* on the viscera often induces vomiting, particularly in upper abdominal surgery. (5) *Narcotics*, administered for sedation, sometimes initiate nausea and vomiting. (6) In some cases the vomiting may be due to *psychic* causes. The cause of the nausea must be determined before proper treatment can be instituted. If due to hypotension, vasopressors and inhalation of oxygen are helpful. If due to traction reflexes, supplementary anesthesia is usually necessary to overcome it. Sedation and hypnosis with a slow intravenous drip of a dilute thiopental solution usually controls nausea of reflex origin or that due to drugs. Anti-nausea drugs intravenously are sometimes effective when other forms of therapy fail.

The Dilemma in Anesthesia
An Analysis of Current and Future Needs

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The dilemma in Anesthesiology is one of supply and demand, and it is a dilemma because it does not seem to respond to the usual forces that bear upon similar situations in our way of life. When unusual circumstances such as these develop, there is often reason to anticipate the presence of artificial barriers which distort the pattern generally expected. In the case of Anesthesia, these circumstances are highly complex and may not be suited to the analysis I have attempted to apply, for the conclusions I have drawn are valid only if certain of the assumptions made are also valid. In this study, the approach which seemed likely to provide the best chance for reasonable conclusions about present and future needs in Anesthesiology was to examine these needs in the light of what is known about how Anesthesia and Anesthetists developed.

Anesthesia and the Development of Anesthesiology

Since the beginning of Anesthesiology more than a century ago, its growth has proceeded principally along two lines: those of recruitment and training of qualified persons to administer anesthetics and second, the investigation and development of better anesthetic agents. In either instance, the change has been great during this historic period; although progress was slow at first, it has proceeded at an accelerated pace since 1850, and more particularly since 1930.

Fundamental to progress in any branch of Medicine is the willingness to work and to learn. But these in themselves are not enough, for there must also be opportunity which is sometimes discovered but more often provided. There is no better example of the recognition of an opportunity than that which sparked the imagination of Dr. Crawford W. Long, the country practitioner from Jefferson, Georgia, to attempt the administration of ether as a means to allay the pain of operative surgery. After watching an "ether frolic" he envisioned the usefulness of this stuporous and painless state as an adjutant to operative surgery. This twenty-seven-year-old physician first tested his theory on a patient named James W. Venable who had a tumor of the neck which was excised under ether anesthesia on March 30, 1842. He neglected to report his observation until six years later; the only record was the combined fee for surgery and

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anesthesia which was billed as $2.00. This was most unfortunate as it provided the basis for much of the storm of public controversy about priority and credit which reached the boiling point about 1854.

The ether story in Boston was the outgrowth of another kind of observation and opportunity. Dr. William T. C. Morton, its principal character, was born the same year as Crawford Long and entered a partnership practice in dentistry with Horace Wells in Hartford, Connecticut. By 1844, Wells had observed anew that it was possible to extract a tooth painlessly from his patients after they were allowed to inhale nitrous oxide. The Wells-Morton partnership was dissolved that same year and Morton decided to enter Medicine at Harvard, but retained his interest in the search for better anesthetic agents. It was for this reason that he consulted Dr. Charles W. Jackson, an experienced chemist, about other potential chemical agents which might possess anesthetic properties. Morton anesthetized himself for eight minutes, and then because of his background in dentistry, his first clinical experiment was performed on a patient while extracting a tooth on September 30, 1846. After his achievement, this Harvard medical student (who never was graduated) wrote to Dr. John C. Warren, senior surgeon at the Massachusetts General Hospital, requesting permission to demonstrate the use of his "Lethon," as he termed his substance in order to conceal its chemical identity until a patient could be secured. Dr. Warren granted permission and suggested October 16, 1846, as the date for the demonstration which took place according to schedule in the now famous "Ether Dome" of the Bullfinch Building of the Massachusetts General Hospital. It was this occasion that provoked the comment of Warren which has become almost as immortal as the demonstration itself: "Gentlemen, this is no humbug."

Morton's patent was issued a few weeks later, November 12, 1846. His reluctance to admit the identity of his substance until he had secured his patent, while a behavior more acceptable then than now, was not well received and later was to prove even more embarrassing when he and Jackson sought financial aid from the Federal government in 1854 in recognition of their work. Senator Dawson of Georgia protested, claiming priority for Crawford Long in his operation performed in 1842, thereby bringing a professional and private matter to public attention from the floor of the Congress of the United States. The evidence submitted in favor of Long convinced Dr. Jackson, who conceded priority to Long. But as other matters were also concerned, it was only natural that with the passage of time, Long's role seemed less significant than that of Morton, and in truth it was. However, in 1877, the year before Long's death, the subject of priority was reopened by the famed New York gynecologist, James Marion Sims. He began a crusade to achieve for Long the renown he believed his discovery to warrant, but never succeeded in diminishing the contributions which were rightfully Morton's. So it is proper that we honor both men.

It is not my intention in this presentation to enter into this or any other controversy in Anesthesia for as a surgeon I appreciate full well the

many contributions and the numerous and varied sources from which they have come. But I might state parenthetically that many a discoverer has lost his priority in favor of another simply because he did not complete his obligations for the opportunity available to him; in the case of Long, it was his delay in reporting his observation until 1848. His was an incidental observation with no organized attempt to pursue the subject much further.

Once the world knew of Anesthesia, anesthetists and anesthesiologists were rapidly needed. Probably the first anesthesiologist was the London physician and famed epidemiologist, Dr. John Snow. Within less than a year of Morton's demonstration, Snow had administered this anesthetic agent 152 times.

It was natural that other volatile substances should be investigated soon thereafter. On November 10, 1847, Dr. John Y. Simpson, Professor of Obstetrics at Edinburgh, announced the use of chloroform as an anesthetic agent which he had administered successfully to 50 cases. Its properties were so attractive that it rapidly replaced ether throughout England, Europe, and even in Long's home state of Georgia. Moreover, chloroform was not surrounded by public and professional controversy and therefore was better accepted for this reason alone.

Snow commented that within the next eleven years after 1846 he administered chloroform some 4,000 times while giving ether on only twelve occasions within the same period. Yet he was aware of chloroform's greater toxicity and wrote of the sudden death from "paralysis of the heart" it occasionally produced. It is comforting at least to note his comments and their implied conclusions, for today we designate such unfortunate deaths as "cardiac arrests"; this sounds much better and is less incriminating. Writing further, Snow commented as follows: "I hold it therefore to be almost impossible that a sudden death from this agent (ether) can occur in the hands of a medical man who is applying it with ordinary intelligence and attention." Others also found the safety of ether to be greater than chloroform but because of the public nature of the controversy about priority for ether, many a physician was reluctant and embarrassed to admit its use. It would also seem that the surgeons had more to say of the choice of the agent used than the man who administered it.

To read the early accounts of Anesthesia, anesthetists, and anesthesiologists would be frightening indeed if one did not also read for comparison the early reports and controversies which raged at the same time over the truth and priority of the germ theory of disease, antisepsis, and asepsis. The outstanding conclusion that may be drawn from these mid-nineteenth century debates in Medicine was the wisdom of settling intra-professional disputes within our own ranks. This was seldom done, but it does not in any way diminish the validity of the conclusions. Honest differences are easily resolved when the involved parties possess an authority derived of knowledge, scientific data, and experience. In the long run, however, the final acceptance or rejection of any agent or procedure must rest upon the accumulated clinical experience of others.

It was the combination of the discovery of Anesthesia, antiseptic and aseptic surgical principles which permitted enormous advances that were made in Surgery during the last twenty-five years of the nineteenth century. In turn there followed the need for the rapid development of the corps of anesthetists to administer anesthesia to the ever-increasing numbers of surgical patients. Where were these anesthetists to be recruited, and what background in training should they be expected to have? From 1846 until approximately 1880, most anesthetics apparently were administered by physicians. But as experience accumulated, this was accompanied by a false sense of security and confidence. Many surgeons employed their chauffeurs to administer ether to patients, especially when the operations were performed at home. The words, "etherizer" and "etherizing," soon came into common parlance. However, in the few major hospitals where internships were available, though not then required, this etherizing became a part of the intern's function. In fact, the first records of blood pressure, pulse, and respiration were those compiled in 1895 by Drs. Harvey Cushing and Amory Codman when they were interns, while serving as "etherizers" at the Massachusetts General Hospital. From Cushing's letters to his family, we learn that he engaged in "etherizing" patients during his second year as a medical student in 1892. One of his most regrettable experiences was that detailed in a letter written home about a death which occurred from his administration of an ether anesthetic on January 10, 1892, to a patient with intestinal obstruction from a strangulated hernia. The circumstances were especially unpleasant as it was a part of a demonstration before his 122 classmates. No doubt this occasion had a compelling influence upon the "ether charts" which he developed with Codman two years later.

Just when the registered nurse first began to administer anesthesia is unknown to me. Despite the nursing profession as the most logical source of auxiliary help in this rapidly expanding field, apparently nurses were not extensively engaged in these activities prior to 1880. In 1899, a nurse-anesthetist was employed at the Mayo Clinic. Seeking an answer to this relatively late development, I was somewhat surprised to learn that in the United States, nursing as a profession was the outgrowth from the military orders of Catholic and Anglican sisterhoods and from the Deaconess movement. The first of these indigenous sisterhoods was the Sisters of Charity which accepted nursing responsibilities in 1823 at what is now the hospital of the University of Maryland. By 1850, the need for nursing schools was being advocated in Massachusetts, particularly by Shattuck, and was foreseen as a national essential in 1858 by Dr. Samuel D. Gross of Philadelphia. The work of Miss Nightingale in 1860 served to establish an improved pattern for nursing schools and to solidify the efforts to improve nurses' training throughout the world. Many other prominent names might be mentioned both before and in the immediate period to follow.

Current Needs and Trends in Nurse Anesthesia

One of the first schools for the training of nurse-anesthetists was established in this country at Western

Reserve University in 1915. Other schools rapidly sprang up. For the first time, nurse anesthetists began to appear in many operating rooms throughout the country. This change in policy and practice for the first time began to arouse resentment among the physician-anesthetists who had specialized in Anesthesiology. Fortunately, the 1917 ruling for an appellate court in Kentucky stated that the administration of an anesthetic by a nurse did not constitute the practice of Medicine if she performed these duties under the direction of a physician. As the numbers of nurse-anesthetists increased, so did the number of postgraduate nurses who entered this nursing specialty and which they sought to organize as a professional subspecialty for the purpose of bringing together their learning experiences as a means for teaching one another. The American Association of Nurse Anesthetists was formed in 1931 with this as its major goal, and your Journal, now in its twenty-fifth year was first published in 1933. It provided the common bond that is so important to the effectiveness of intraprofessional communication and the reporting of the advances in your specialty to encourage the "keeping up" with the rapid changes and improvements in Anesthesiology. I note also that this is the twenty-fifth Annual Convention of your Association which has fostered further these opportunities for the exchange of ideas and other matters worthy of professional discussion at the group level or the less formal but equally effective personal exchange of experience gained from your work.

It is difficult to obtain the proper perspective of the relationship of the nursing profession to other fields of employment for women and, for that matter, the relationship of nursing in Anesthesia to the nursing profession as a whole. Some of the following facts have been helpful to me in the preparation of this manuscript and I hope will be of interest and assistance to you also. In 1950, the Census Bureau disclosed that a total of 22,000,000 women were employed in this country. Of these, 2½ per cent or about 550,000 were engaged in professional nursing, which ranked ninth among the first twenty occupations in which these 22,000,000 women were engaged. Of the approximately half-million women in professional nursing, your Association claimed membership of 7,547 in 1954 or about 1.4 per cent of all women engaged in the nursing profession. Another 8,000 nurses were estimated as engaged full-time or part-time in the administration of anesthesia.

From the number of occasions that I have met with the officials of your organization during the past several years, I know that you have been concerned with two major problems: what can your profession expect the future in Anesthesiology to bring and second, how can you recruit nurses to meet adequately your responsibilities in the next decade or so? If we attempt to appraise these facts and figures in terms of what they may represent in our present-day needs in Anesthesia, we encounter the necessity for certain assumptions that are fundamental to any conclusions we may reach. However, these assumptions are not without some validity and they provide the basis for intelligent guesses. Any disagreement is more likely to be in numerical values than in the substance they entail.

As of July 1, 1957, there were 6,966 hospitals within the continental United States. During the twelve preceding months, a total of 22,089,719 admissions were made to these hospitals, of which 94.2 per cent or about 21,000,000 were to general hospitals. Psychiatric admissions constituted another 2.5 per cent or a little more than half a million of the 22,000,000 admissions, despite the fact that about 50 per cent of hospital beds in this country are for psychiatric patients primarily in custodial care. The remaining 3.7 per cent or 750,000 admissions were about evenly divided in various specialty hospitals, between those for the treatment of tuberculosis and other specific diseases, *i.e.*, diseases of women, children, bone and joint diseases, etc.

From these facts we would like to learn the number of anesthetics which may be administered in the course of a year to these more than 22,089,719 admissions during the twelve months in 1956-57. It seems to me unlikely that many of these institutions are entirely free from the potential need of anesthesia in the course of a year, at least upon some occasions. Unfortunately, we do not know the precise number; in fact, we do not even know the approximate number of anesthetics administered per year. At best we can only guess. It seems reasonable to me that no less than 25 per cent of these admissions would be in association with the administration of a general anesthetic agent in the course of any one period of hospitalization. For one thing, there are some 4,000,000 childbirths per year; possibly half of these patients receive some form of obstetrical anesthesia. As shock therapy is generally administered in conjunction with the administration of an anesthetic agent, this group of psychiatric patients would also contribute its share of those requiring the administration of a general anesthetic agent. Other specialty hospitals would seem to need the services of someone who specializes in Anesthesia to no less an extent than that which patients admitted to general hospitals require. This leaves the 21,000,000 residual admissions in which we would find most of the obstetrical admissions, aside from all the other types of admissions which comprise the daily census in the so-called general and short-term hospital admissions. It seems to me that nearly one-third of the total admissions could be associated with Anesthesia in the course of hospitalization, and that about 25 per cent or 6,000,000 of the total admissions would be a conservative figure in attempting to estimate the total anesthetic needs per year.

Let us suppose for the moment that all anesthetics were to be administered by a Board-certified anesthesiologist. This may seem to be the ideal, but it also seems to me to be an impractical goal to seek for a variety of reasons. As of 1956, there were about 1,500 certified anesthesiologists presumably still active in practice, according to my count of the names listed in Volume 8 of the Directory of Medical Specialists (actually my count disclosed 1,504). If we assume that each of these certified anesthesiologists could work twelve hours a day, six days a week, exclusive of Sundays and holidays, and another thirty days for sickness and vacation during the year, approximately 270 days then would be available in which the anesthesiologist might accomplish this task. In other

words, this would seem to be the maximum use of time and of this source of talent and exceeds what anyone might expect in terms of an adequate performance. For purposes of further discussion, let us assume the average general or spinal anesthetic in our speculations requires about one hour with another twelve minutes to prepare for the next case. Under these circumstances, the certified anesthesiologist could accommodate the 6,000,000 admissions we have estimated as the conservative total given per year. But to do so, each anesthesiologist would be forced to administer personally, slightly more than twelve anesthetics per day throughout 270 days. This would be an impossible feat to expect, as each certified anesthesiologist would be confronted with about 4,500 anesthetic administrations per year.

If viewed from another side, there were in the year ending July 1, 1957, 3,960 general hospitals with bed capacities ranging from 50 to 500 or more, and another 2,660 general hospitals with 49 beds or less. Were we then to restrict the administration of anesthesia to Board-certified anesthesiologists, more than twice the number of anesthesiologists would be required to place one in each of the 3,960 general hospitals with bed capacities in excess of 50. Slightly less than twice the number currently available would be required were one assigned to each hospital with a bed capacity of less than 50; in other words, about four times the number of certified specialists currently available. The impracticality of this situation can be vividly imagined from the appearance of the face of the tormented surgeon as he sits in line awaiting his turn to operate. Moreover, he would not consider as necessary the requirement that he complete all of his operations in one hour or less. He, just as the anesthesiologist or the anesthetist, has other functions to perform each day in his patient care. There are rounds to make, consultations to see and, of course, his office commitments to meet.

Clearly, some other solution is not only essential but also highly desirable for the anesthesiologist, the surgeon and the patient. Moreover, such a routine would soon make Anesthesiology so unattractive to interns and residents that few if any would consider the personal sacrifice worthy of the service they wish to render however great the financial reward might prove to be. Enough is enough—and this would be intolerably more than enough by several-fold. This conclusion is amply supplemented by the scarcity of qualified graduates from accredited medical schools who apply for residency training in Anesthesiology.

Why does Anesthesiology not attract more of the young residents for training in this specialty (qualified graduates of American Schools of Medicine)? Actually, this is difficult for me to assess. Certainly Anesthesiology comes as close to applied pharmacology, biochemistry and physiology as any of the surgical specialties do; in fact, it probably has no serious competitor in this respect. If one is interested only in patient care and the greatest possible number of patient contacts, this phase of Surgery is the one most likely to provide adequately for this desire. If the young physician wishes primarily to relieve suffering from pain, this, too, he can best accomplish in Anesthesiology. If he feels that his personality may not

lend itself well to the attraction of an active practice, he need not fear Anesthesiology as long as he is competent and has the confidence of several surgeons who will seek his services regularly, regardless of personality shortcomings. If he feels financial burdens may prohibit further training beyond his internship, he can discover for himself that most residency programs pay better if not the best of any residencies available and moreover, require but two years of formal training. The remaining three years are spent in getting additional experience in private practice. Financial incentive cannot play a determining role, not only because there is less reason for the resident to go deeply into debt, but the income from practice in Anesthesiology rises more rapidly in the earlier years than generally occurs in any other form of surgical practice; moreover, the anesthesiologist can generally continue to practice, if physically able, after the age of 65, when many surgeons no longer operate.

Despite all of these attractions, Anesthesiology competes unfavorably in most hospital residency programs, including the best of our university teaching programs. The reasons for this are not evident to me. As of July 1, 1957, there were 191 residency programs in the United States approved for training in Anesthesiology; these institutions offered places for 534 residents to enter this specialty last year, or places for 1,068 residents in the two-year program. How many of these positions were filled by qualified American graduates is not known, but in discussing this matter with anesthesiologists and my colleagues in Surgery elsewhere, it would appear that many, perhaps the majority, of these positions are held by graduates of foreign medical schools who generally return to their native country to practice Anesthesiology. This would appear to be the reason for the continued severe shortage of Board-certified anesthesiologists in this country, or at least one important reason.

Unless this pattern changes, and there is no indication that it will in the foreseeable future, in a few years the number of certified anesthesiologists who retire from active practice will approximate those who are certified each year. We may be reaching this equilibrium sooner than expected. Thus it would seem that the demand for qualified nurses in Anesthesiology is likely to increase than to diminish. Some of these data are shown in the table on the following page.

Future Needs and Training in Nurse Anesthesia

The surgeon must depend heavily upon his anesthetist or anesthesiologist, for he cannot give the anesthetic and operate at the same time; we only think we can. A competent anesthetist, nurse or physician, is therefore an essential part of the surgeon's team. The surgeon's requirements for competence in Anesthesiology will increase rather than diminish as Surgery invades more complex fields. The newer fields of Surgery are often pioneered by younger surgeons with creative ideas and the drive and enthusiasm to exploit and develop these opportunities. New developments of this type are not for old men. The present status of cardiac surgery is a case in point; the vast majority of these surgeons are under 45 years of age.

I.	**Number of Physicians giving Anesthesia**		**3,360**
	a. Board certified	1,139	
	b. Not Board certified but practice said to be limited to Anesthesia	1,314	
	c. Not Board certified with Anesthesia being only part of total practice	907	
II.	**Number of Nurses giving Anesthesia**		**15,547**
	a. Certified by A.A.N.A.	7,547	
	b. Not certified and estimated by A.A.N.A.	8,000	
III.	**Total of Physicians and Nurses giving Anesthesia**		**18,907**
IV.	**Percentage Relationships**		
	a. Percentage of Total giving Anesthesia Who are Physicians		16.7%
	1. Board certified	6.1%	
	2. Limited to Anesthesia but not Certified	6.5%	
	3. Part-time in Anesthesia	4.1%	
		16.7%	
	b. Percentage of Total giving Anesthesia Who are Nurses		83.3%
	1. Accredited by A.A.N.A.	40.0%	
	2. Not Accredited by A.A.N.A.	43.3%	
		83.3%	
	c. Total		100.0%

If nurses in Anesthesia are to find a role in fields of this degree of complexity, it is essential that your training schools increase the intensity and quality of training and especially to improve the teaching and understanding of the physiology of the circulation, respiration and metabolism. More specifically, a thorough and practical knowledge of hemorrhagic shock, blood loss and replacement, fluid and electrolyte disorders, the consequences of various anesthetic agents and drugs you are asked to administer, and other related problems such as the age and weight of the patient, hepatic, renal, cardiac, pulmonary and neurologic physiology and disorders, must now be encompassed as best you can.

Your best chance for success lies in recruitment of *young* nurses, preferably to have them enter your field directly after graduation. In my opinion, if you cannot persuade your ruling bodies of professional nursing that it is important the young graduates from your schools of nursing enter nursing anesthesia as a profession. your role in Anesthesiology is not likely to progress.

In looking to the future, I am not recommending that we evolve competent nurses as incompetent physicians. Our two professions are interdependent but also separate in both purpose and function. Yet if you do not seek diligently to keep pace with the advancing complexities in Anesthesiology you cannot expect to retain a worthy relationship with the anesthesiologists and surgeons you serve. If standards are to be raised in nursing anesthesia, proper training programs such as those sponsored by your organization are of course the

primary requisite to this end. As hospital accreditation is extended to the smaller institutions, certainly the quality of nurse-anesthetists as well as anesthesiologists will come under its critical eye. Therefore, the nurse without formal or accredited training will almost certainly disappear. But she cannot be displaced unless her place can be filled by nurses of greater competence. This is the challenge which lies before you.

If more young nurses are to be recruited for Anesthesiology as a nursing specialty, your nursing profession should not hold to the view that because this is a specialty, it has no place in the training and educational experience of the undergraduate nurse. How else is she to learn what Anesthesiology has to offer? In perusing through one of your leading and most recently published books about nursing and its opportunities a few days ago, I was surprised to see no discussion about careers in nursing anesthesia. However, these are primarily problems for the nursing profession to solve, although I cannot but express some personal concern, as the failure to recruit young and competent nurses into Anesthesiology will affect adversely my field—Surgery.

I have purposely avoided discussion of procedures that the nurse-anesthetist is competent to manage, for this is a highly personal matter and depends almost exclusively upon ability and competence of each individual. I have been pleasantly surprised to learn from my surgical colleagues the extent to which nurse-anesthetists have been successfully employed in many major operative procedures.

As you know, professional relationships among the nurse-anesthetist, anesthesiologist, and the surgeon are most delicate ones and unfortunately they are not always properly fostered. At times, this mutual respect has been lacking and has created insurmountable problems in some communities—at least for the time being. Few surgeons object to a nurse administering an anesthetic, provided she is highly competent, for he is just as disturbed with the administration of an inadequate anesthetic by a poorly qualified physician-anesthetist. The best arrangement, therefore, appears to be one in which professional competence is unassailable and the financial relationship is highly honorable and commensurate for services rendered. Much less important, if of any consequence, is who pays whom as long as there is neither exploitation nor misrepresentation of this essential part of our professions.

Thus while the professional relationship between the anesthesiologist and the nurse-anesthetist has not always been a cordial one, this need not obtain. Difficulties encountered arise from both sides, but I am embarrassed to admit that we physicians are more often at fault than you. Human nature itself is not likely to tolerate disagreement very well when emotional turmoil is involved. But when there are honest differences, intelligent and thoughtful discussion can generally be fostered freely to the benefit of all. A satisfactory solution is nearly always possible if these differences can be amicably discussed with but one motive before us: the continued improvement of patient care and his welfare. This is your creed and mine.

Is Obstetrical Anesthesia Different?

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When I started mulling over this title, an experience of many years ago came back to me. When I was a very young and starry-eyed premedical student, during summer school I roomed across the hall from a middle-aged nurse. She had so much experience of the world of medicine that I dreamed about, and I loved to talk to her. When I found that she much preferred obstetrical nursing, and asked her why, her answer was that it was the only time that doctors and nurses were needed that was a happy time. And I really think that that is what makes any aspect of obstetrical work different from any other form of medicine. It *is* a happy time — a normal, physiological, to-be-desired time — when all goes well. Because most of the time it does go well and easily, we who work in the field all the time are apt to get so involved in routine that we may forget the wonder of a new life starting on its own in the world, and the thrill to the mother of the greatest achievement of her life. But, I don't know anything that is more distressing to supposedly hardhearted, callous hospital personnel than losing a newborn baby, or worse yet, a new mother. The person responsible for anesthesia in the delivery room is an integral part of the team which tries to prevent the latter, and facilitate the former.

Statistics

Of the approximately 12,000,000 anesthesias administered in the United States each year, more than 4,000,000 are for obstetrical procedures. Even though the vast majority of obstetric anesthesias are of short duration and are administered to patients in good health and without complications, at least 75,000, or 2% of the total are for caesarian section. This operation carries a recognized mortality of 1% throughout the past decade. One-half of the maternal deaths in these patients delivered by caesarian section are related in whole or in part to anesthesia, according to Hingson and Hellman.[6] More than 10% of the obstetrical anesthesias are administered to patients with toxemia, hemorrhage or major complications of the circulatory, metabolic or respiratory systems. At least 5% of these anesthesias are administered to patients delivering premature babies in whom the mortality ranges up to 50% in the 1500 gm. and smaller babies. Anesthesia for such problems should certainly not be handled by the novice.

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It is most unfortunate that the delivery room has so frequently been the "stepchild" of the anesthesia department, with, at best, the most inexperienced personnel assigned to it, and frequently no real provision made for anesthesia. Dr. John Bonica has recently stated,[3] "It is generally conceded that the contribution made by the rapidly developing science of anesthesiology constitutes one of the most important factors that has made possible the greatest advances in surgery in the past quarter of a century. Unfortunately, the same cannot be said in regard to obstetrics. While it should be readily admitted that many of the improvements made in anesthetic practice have been applied to obstetrics, the contributions in this field have not been commensurate with the progress made in anesthesiology. This is especially true in regard to the administrator, a factor that, in the final analysis, is the most important to be considered." The serious need for attention to the problems of obstetric anesthesia must be apparent to all when it is considered that aspiration of vomitus during or following delivery remains an important cause of maternal mortality and morbidity (causing about half of the maternal deaths in a recent Maternal Mortality Commission study), that the part played by anesthesia in neonatal mortality and morbidity is yet far from being defined, and that many infants still succumb to asphyxial incidents at birth who might be salvaged by the expert care which a qualified anesthetist can give.

Differences

Now, let's look into the factors which are specifically different in obstetrical anesthesia. First, quite obviously, we are dealing with two patients, first at the same time, and then independently of each other. These two patients have different requirements as to oxygenation, pain relief, etc. We can follow the mother's physiological state fairly accurately. But we necessarily have to proceed rather blindly as to what we are doing to the unborn child.[5] And after delivery, we have two patients to care for at once. No matter who takes over any necessary resuscitative measures on the infant, we have helped produce the situation, and are at least to some extent responsible for the baby's condition, and whatever treatment is necessary.

Obstetrical patients, unlike patients for planned surgical procedures, frequently present themselves near delivery in precipitous labor after having eaten a full meal. Thus, anesthesia is called for in an unpremedicated and unprepared patient. Frequently, many hours of analgesia and seminarcosis precede anesthesia in obstetrics to provide for the control of the pain of labor. These patients are frequently exhausted and sometimes quite dehydrated.

During vaginal delivery, there is a constantly changing need for pain relief and for muscular relaxation or lack thereof. After all, in most surgical patients, analgesia and relaxation needs are relatively the same throughout the operation. The rapidly changing requirements during the second and third stage of labor make obstetrical anesthesia more difficult and more wearing for the anesthetist.

Similarities

Now let us examine how obstetrical anesthesia resembles surgical anesthe-

sia. Patients are individual human beings, and no two women having a baby, or even one woman in different labors, present quite the same problem. There has unfortunately been a great tendency to treat all obstetrical patients by the same technique. They are *not* all the same, either in physical condition, psychological state, type and stage of labor, etc. Nor do the obstetricians conducting the delivery always have the same amount of skill or temperament, and this must be considered. Anesthesia must be planned to fit the particular situation, and based on the principles of pharmacology and physiology common to all anesthesia.

Obstetrical anesthesia actually begins when the patient enters the labor room. Probably, there is no one more confused about anesthesia than an expectant mother going to the hospital for the delivery of her first child. For weeks she has been reading popular articles about new drugs, hypnosis, natural childbirth, spinals, saddle blocks, etc. She has discussed the subject with her friends who don't know much more about it than she, and she is hopelessly confused on the subject. Then she arrives at the hospital in pain, usually at a time when her obstetrician is not present. She may have had previous unpleasant or frightening experiences with anesthesia. It is accepted good practice in surgical anesthesia for the patient to meet his anesthetist before he goes to the operating room and get a chance to learn what to expect. I wish that this procedure could be extended to obstetrical patients. Timing of labor and other patients' deliveries will make this impossible on occasion, but certainly many times the anesthetist sits around without much to do, and could manage to make preanesthesia visits.

I'm sure some of you must have read the article in the recent Ladies Home Journal about cruel treatment in childbirth. Although I can't understand some of the tales recounted, certainly some of them can be rather obviously explained as misunderstanding of the procedures used and the reasons necessary for them. Predelivery visits should help such unhappy misunderstandings.

Many workers have felt that good psychic preparation reduces the need for sedation and anesthesia, and facilitates the progress of labor. Although this is not universally accepted, we all know that the calm patient is much easier to anesthetize, and the unknown is a large factor in fear.

"Natural Childbirth"

This brings up the subject of so-called "natural childbirth." The development of the psychosomatic approach to obstetric pain relief parallels the general development and interest in this phenomenon in all of medicine. I feel that in some areas the pendulum has swung overly far in this direction, but we had previously gone overboard in the direction of pharmacological pain relief. These new approaches appeal to the educated, mature private patient, but are incomprehensible to the patient whose fears and superstitions are so primitive and basic that she cannot and does not comprehend the psychological approach to pain. Natural delivery has its place, but, again quoting from Hingson and Hellman,[6] "is not the goal for every woman, nor need it be considered the ideal for American obstetrics." They also feel that "the great danger in the total accept-

ance of the Read philosophy is a deterioration in the quality of anesthesia available, so that when it *is* needed, it is neither expertly given, nor wisely chosen." However, many of the Read techniques have always been used instinctively by many doctors and nurses, and are certainly desirable.

Effect of Drugs

The optimal time for starting medicinal analgesia must be the responsibility of the obstetrician. Many drugs and combinations of drugs have been used, and no one technique is entirely satisfactory. Theoretically, medication should be aimed toward analgesia rather than toward amnesia, but this is difficult to achieve. All of our present analgesics of necessary potency depress the respiratory and possibly the circulatory systems of both the mother and the infant. Such depression is potentially more dangerous to the infant than that from the inhalation anesthetic agents, since the latter can be recovered from the infant by pulmonary ventilation after delivery. Even low concentrations of inhalation anesthetic agents may potentiate the depressant effects of narcotic analgesics. Narcotics should be given to the mother sparingly, and should be avoided in the last sixty to ninety minutes before delivery. Barbiturates and scopolamine are less depressant to the mother and child. However, agitation not uncommonly results, and occasionally one encounters a patient who responds to these drugs with unusually deep sedation.

The advent of narcotic antagonists, such as Nalorphine (Nalline) and Levallorphan (Lorfan), makes the use of narcotics in labor somewhat less dangerous. Trilene or nitrous oxide and oxygen may be used for first stage analgesia, frequently self-administered, but have not been entirely satisfactory. All drugs used to control pain in labor and delivery in sufficient quantities exert effect upon and may stop uterine contractions. Thus, there must be a blend of pain relief compatible with progress in labor. Pleasant surroundings and good "TLC" can do much to reduce the need for analgesics.

Pain

The first step toward the alleviation of suffering during labor and delivery is the recognition of pain as a psychological interpretation of a physiological entity. While it is true that frequently the intensity of pain in protracted labor is intensified by such factors as disproportion, cervical and birth canal rigidity, emotional fear, fatigue—and I believe that this factor is frequently not sufficiently appreciated—even in physiologic labor the pain is real. Patients vary in pain threshold, in psychological reaction to pain and in expression of their reaction. Pain is a difficult thing to evaluate and study. But, along with all the stress on so-called "natural childbirth" today, I wish more people were aware of the study done by Hardy and Javerts[7] at the New York Lying-In Hospital using the Wolff, Hardy, Goodell technique, which I believe is generally accepted as an excellent technique for such studies. Thirteen unmedicated women, who knew well the principles of relaxation, volunteered to go through the major part of labor without medication in order that they might compare the discomfort from true labor with pain of standard intensity to which they had been previously calibrated. This pain is expressed in units called dols,

with 10.5 units or dols between threshold and ceiling or maximal pain. The mean intensity of the pain during the first quarter of the first stage was no more than 2 dols. The pain increased progressively in intensity, ranging from 3 to 5 dols in the second quarter, from 5 to 7 in the third quarter, and from 7 to 10 dols during the final quarter and through the second stage of labor. In the third stage, it ranged from 3 dols to threshold. Thus, in these uncomplicated, normal labors, the pain went up to or close to the amount of pain which can be appreciated. These patients are entitled to sympathy, kindness, and all the pain relief we can safely give them.

In the management of analgesia for the second and third stages of labor, the many possible techniques divide themselves into three categories. 1. The psychological lobotomy such as the Read method, and related techniques; 2. the neuromuscular blockade, or conduction techniques; and, 3. encephalic obliteration. The conduction techniques include spinal and caudal, either single dose or continuous, and pudendal block.

Advantages of Regional Methods

The dosage of depressant drugs to the mother is reduced or omitted, and the baby receives practically no depressant agent, a great advantage with premature infants or others in special jeopardy. To many women there is a psychological value in being alert and able to appreciate the arrival of her child. The possibility of aspiration of vomitus is greatly reduced. Sometimes spinal block hastens cervical dilatation; this is not consistent. However, these techniques require special training on the part of the operator, and the continuous techniques are very time-consuming. They are frequently inapplicable in precipitous labors. Hypotension may be a real problem, and infection is a possibility. Respiratory depression and paralysis are potential hazards. These blocks may slow down the course of labor, and make the patient unable to bear down with a consequent increase in low forceps deliveries. Postoperative headache and, more rarely, paralysis may occur. A regional technique which could well be used more frequently is pudendal block. It is technically simpler than a spinal or caudal, and is less likely to produce hypotension and infection. Good perineal anesthesia and relaxation can be obtained, but relief from the pain of uterine contractions is not provided. It is an excellent choice for the patients who have recently eaten, and for those for whom spinal or general techniques are contraindicated. When combined with nitrous oxide, it can provide complete comfort for the mother. When the obstetrician does his own spinal or caudal block, the patient must be watched closely by someone else who can recognize and treat complications as hypotension and respiratory depression. If such personnel is not available, pudendal block is much safer.

General Anesthesia

Encephalic obliteration with inhalation agents is the most controllable method of obstetrical anesthesia. It is usually available, and can be given to the patient who is crowning, moving, or uncooperative. It is the most reliable from the standpoint of the patient. Any of the inhalation agents may be chosen; nitrous oxide is probably the most commonly used.

Adequate oxygenation is essential with all agents. Deep anesthesia is not necessary for normal vaginal delivery. Controversy exists over the use of Pitocin with cyclopropane and oxygen, because of the possibility of traces of pituitrin in the Pitocin which may cause coronary constriction. If the agents must be used together, particular attention should be paid to the excellent oxygenation of the patient. Pentothal® crosses the placental barrier rapidly and is usually frowned upon for obstetrical use, but I have occasionally used it for a precipitous delivery very satisfactorily. It can be a very useful adjunct to nitrous oxide during the third stage after its effect on the baby need no longer be considered.

The usual indications and contraindications for all of these agents hold in obstetrics, as elsewhere. But, when faced with a poor-risk patient, or a complicated physiological state, stick to the agent and technique with which you are most familiar, as always. Complications such as hemorrhage, vomiting, hypotension, convulsions, cardiac arrest, etc., must be treated as they would be in any anesthetized patient. Good recovery room care is essential, and recovery rooms are as important to the delivery room as to the operating room.

Complicated Delivery

So far we have been discussing normal vaginal deliveries. They aren't all so simple. Occasionally, great relaxation of the abdominal wall and uterine musculature may be needed, as for podalic version. Cyclopropane and oxygen are valuable for rapid deepening of anesthesia with a quick return to light planes to permit the return of uterine tone and to prevent excess bleeding. Curare or succinylcholine chloride can be very useful for extreme relaxation for the delivery of a large aftercoming head. I recently had occasion to anesthetize a patient for the delivery of conjoint twins joined through the trunk. The situation was not recognized until one head was born, and the obstetrician was reluctant to do a section at that stage of the game. Deep ether and a large dose of succinylcholine permitted the babies to be delivered from below with very little damage to the mother. We knew that the first baby was already dead, and I wasn't worried about harming the babies, and I did have to breathe for the mother for about fifteen minutes, but I believe it was a good answer to a very unusual situation!

The increased mortality and morbidity rate for both mother and child with cesarean section has led to a great deal of interest and research into anesthesia for this field. My own preference is spinal anesthesia if the mother is in good condition. It may be supplemented with Pentothal® after delivery if desirable. Here the psychological attitude of the patient toward spinal anesthesia would not change my choice, but much can be done with "vocal anesthesia", "TLC", or whatever you want to call it, until Pentothal® may be started. In a shocked patient, I prefer cyclopropane and oxygen, but there are many other acceptable techniques. The skill and judgment of the anesthetist is more important than the agent or technique.

Although no mother ever died from the pain of childbirth, many die annually from attempts to relieve it.[2] Maternal mortality resulting from

the complications of anesthesia used improperly is assuming relatively greater significance, as the antibiotics have so greatly reduced maternal death from infection, as better prenatal care and diet therapy have reduced mortality from toxemia, and as blood banks, fluid replacement therapy and better understanding of the oxytoxics have reduced maternal mortality from hemorrhage. Hingson and Hellman[6] stated in 1956 that in their opinion maternal deaths resulting from or related to anesthesia are in fifth place after heart disease as a contributor to mortality. No single agent is responsible or is immune to the production of this mortality. Variations in the figures relating mortality to agent or technique coming from various clinics probably are directly related to the skill in the use of various methods in that particular clinic. Aspiration of vomitus appears to be the largest single precipitating cause of death, while this factor plus spinal shock and cardiac arrest account for 69% of the maternal deaths related to anesthesia.[8]

Infant Resuscitation

It is not possible to make definite recommendations as to who should be responsible for infant resuscitation. The obstetrician, pediatrician, anesthetist and obstetrical nurse should all be taught to take care of a depressed infant, for each is free at different times. The anesthetist's familiarity with airway problems and respiratory physiology makes him or her the ideal one theoretically, but it may be impossible to leave the mother. The anesthetist can prevent much need for resuscitation by hyperventilating the mother with 100% oxygen during the actual delivery and until the cord is cut. This is a much more effective way of oxygenating a baby than trying to inflate its lungs after it is born. This can be done with any form of anesthesia. Practice at intubation on stillborns will give much good experience to all delivery room personnel, and should be standard practice.

Much more research needs to be done on resuscitation of the newborn. The work of Dr. Apgar and her coworkers is outstanding in this field, but she states that the more she works with this problem, the less she is sure of. Many of the ideas which we have all had drilled into us do not hold up under careful statistical research. The question of infant survival is not answered by the reaction of the infant at birth, and she now questions whether one bears any relationship to the other. In spite of the fact that general anesthetic drugs are known to produce more sluggish infants, there is no significant difference between the two major categories of anesthesia, general or spinal —either in those infants born at term, or in those in special jeopardy because of prematurity or cesarean section.[1] Even changes in fetal heart rates seem of little significance. We are really working very blindly as to what we are doing to this baby when we anesthetize its mother. The chief factor in delivering good babies seems to be avoiding depression of maternal circulation or respiration.

Personnel

Staffing problems in the delivery room are great. The practice of obstetrics has been called the "specialty of nocturnal practice superimposed upon an eight-hour day"! This is equally true of obstetrical anesthesia. Such around the clock coverage is

difficult, and the means for providing it will vary with the individual hospital, but provided it must be. I happen to be one of the people who believe that rotation of operating room and delivery room personnel is not desirable if it can be avoided. Obstetrical and surgical anesthesia are as different as obstetrics and surgery. There are fundamental differences of depth, duration and induction; and altered anatomic, physiologic and endocrinologic differences between the obstetric and surgical patient. It is essential for the obstetrician to understand the principles of anesthesia, and for the anesthetist to understand the obstetric principles of labor and delivery. The anesthetist must be completely familiar with the milieu of the Obstetrical floor. Hingson and Hellman[6] state that they have found it easier to teach basic anesthesia to an obstetrician than to teach obstetrics to the anesthetist. The more consistent the personnel, the better teamwork can be produced between obstetrician and anesthetist.

Obstetrical anesthesia has horrible hours, alternating periods of too much work or not enough to keep it interesting, it can be allowed to become extremely routine and dull. But it can be very satisfying to help with planning optimum care in the first stage. Even in anesthesia, where it is always a little bit of a question as to what might change in the next second, obstetrics can change fastest of all. Wearing, but a very real challenge. And what can compare to resuscitating a limp, cyanotic baby and starting it out on the road to life? I'm probably a confirmed sentimentalist, but I still think it's a "happy" place to work with satisfactions not to be gained elsewhere.

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Psychology and the Nurse Anesthetist
A Follow-up of Actual Experiences

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The improvement of human relationships is a serious concern to most of us. There is more tension, conflict and misbehavior than we care to have. At times, some of our problems seem insurmountable. Nevertheless, there are usually several things that *we can do* to alleviate trying situations involving the behavior of human beings. It was with this in mind that we published the first article, *Psychology and the Nurse Anesthetist.*[1] We were well aware however that the article needed authenic anecdotal and case-study material. Thanks to contributions from members of AANA, we now have specific incidents to present.[2]

Before discussing the specific situations, let us review briefly the major ideas for action suggested in the first article. The key idea was that the most powerful means at your disposal for influencing the behavior of other people is your ability to change your behavior. The basic negative suggestions were learning when not to talk, when not to be "bothered", and when not to do what one feels like doing impulsively when confronted with misbehavior. Once one masters this behavioral control, it was then suggested that one's energy be put into learning the "art" of encouragement. Positive suggestions were recognizing what people do well, mutual trust and respect for fellow human beings, offering a choice, humble and subtle use of humor, ingenuity in doing the unexpected and the development of self-confidence.

In this article as in our first, it is emphasized and implied throughout that the situations described are atypical. Even though they represent realistic conflict situations involving normal people, the percentage of occurrences is low. At least one-third of our respondents confirmed the conviction that by far the majority of people in our hospitals work well together. Nine respondents stated that they had no "problem" surgeons and, relatively speaking, no human relation problems. Several respondents

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[2] Following the fine reception to the first article, it was decided to invite members of the Association to submit actual experiences in human relations. The response was most gratifying. The forty experiences submitted not only make this short presentation possible but give us considerable manuscript material for a small book. The author wishes to thank each contributor for his part in this project and, at the same time, to appeal once again for contributions from the many members who have had such experiences.

mentioned that they had found ways of preventing small misunderstandings from building into serious conflicts. Many have discovered for themselves the salutary effect of "minimum talk" in conflict situations.

It is hoped that the following actual experiences and comments will make the previous suggestions for action more meaningful.

Illustration 1.—Offering a choice and firmness.

One of our surgeons met me in the hall and said, "I have a problem child 9 years old in to have his tonsils removed. This is his third time in. He raised such a fuss the first two times that his parents had to take him home without the operation. I know if it is done this time he will have to be asleep before he comes to surgery. Would you have time to go and see what you can do with him? I don't care what method you use just so we can do the work this time."

I went to the pediatric department to visit the child. An older brother, who was also having his tonsils removed, was in bed. Tommy was sitting in a chair with cap and coat on. As I entered the room, the mother was standing on one side of the door and the father on the other. Each one whispered to me, "Nurse, don't give in this time!"

As I approached, our conversation went like this:

"Good morning Tommy, did you get cold coming to the hospital this morning?"

"I'm not talking to you."

"You will get warm in this room with your coat and cap on. Let me help you take them off."

"Don't touch me or I'll yell."

"You wouldn't do that and wake up all the babies."

Needless to say, we got nowhere trying to reason with him. The nurse was in the room with some medicine for Tommy and I told him to take it like his brother did. He said that he would spit at me if I gave it to him.

"That is just what I want you to do," I answered.

He took the pill and, as he took the sip of water, I moved behind the chair, tilted his head back and held his nose. The pill and water disappeared and Tommy started yelling. I said nothing. The yelling really didn't bother me.

I went to surgery, got the necessary supplies and returned. I found Tommy under his brother's bed.

"Tommy, you can have your choice. Either you come from under the bed and let me help you get ready as your brother is or I'll come under the bed and do it there," I said.

"I'll kick you if you come," he retorted.

"That is what I want you to do," I informed him.

By this time we had accumulated some manpower. An intern and resident supported his arms while I crawled under the bed with Tommy. He started yelling and I put the mask over his mouth. With the mask saturated with Vinethene, Tommy gave up after the third yell. The bed was lifted from over us and Tommy was placed on the stretcher, undressed and prepared for surgery while I continued with open drop anesthesia.

Suffice it to say, Tommy had an uneventful tonsillectomy.

I felt I should see Tommy before he went home. I found him sitting up in bed. When he saw me he smiled.

I said, "Aren't you glad those nasty tonsils are out? You will feel better soon and you will not have those sore throats again."

He nodded his head in approval.

A few weeks later the surgeon informed me that Tommy was doing fine.

Here is an illustration of a *powerful* child. Anyone who knows how to relate effectively to such children should have little trouble relating to other children and adults. This child had already proven his power by defeating teams of adults on previous occasions. Like so many children who resort to misbehavior, he found most adults easy prey. Yet, for all practical purposes, one anesthetist proved to be a match for him. What did she do or not do which was different? Let us examine more closely this dynamic experience in human interaction and

see how it illustrates effective ways of behaving in conflict situations.

This anesthetist is certainly to be complimented on the confidence she displayed during the entire situation as well as her resistance to the discouraging reports from other adults. Reading between the lines, one can guess that defeat never entered her mind. One way or another, she knew that the child would be ready for surgery and, even though he put up a struggle, it was apparent that he soon sensed her self-confidence. Adults previously had expected defeat and Tommy had not disappointed them. When confronted with this adult however, Tommy undoubtedly suspected that he had met his match.

It is obvious from the tone in the report that this anesthetist is interested in pediatric anesthesia and that she loves children. Her trust and respect for children is contagious. Nevertheless, she displayed considerable *firmness*. This was not the usual adult type of firmness where adults demand obedience to authority but rather *firmness in how she behaves*. While obedience to authority can command respect, it often results in fear, resentment and even hostility. Firmness in one's own behavior, on the other hand, seldom fails to earn the respect of children. Tommy's behavior after the operation indicates clearly that a relationship of mutual trust and respect had been established.

Probably the best example of firmness was when she offered Tommy a choice. It is possible that she could have offered better choices or more choices but that is of little significance in this situation. The important thing is that she did give a choice rather than the typical authoritarian command. She knew and, he at least suspected, that she would be firm in carrying out either choice. Tommy knew only too well that the realistic way out was to accept the first choice. Nevertheless, he tried to call her bluff as he had done with so many other adults. However, when he failed to choose the logical choice, she resisted the temptation to talk and moved into action. *She behaved as she said she would*. Tommy knew that he had asked for it by refusing the first choice and that it was not just personal imposition of her authority. It was at this point that she really won his respect. This anesthetist demonstrated that she knew the subtle psychological difference between ordering people around and offering them realistic choices. With children especially, they immediately sense the difference and appreciate the trust shown for their intelligence by adults who offer choices. A greater willingness to cooperate is usually the ultimate result. If Tommy had stayed in the hospital, he could well have been one of her most cooperative patients.

Although the anesthetist talked too much in the beginning, she caught herself in time and realized the uselessness of reasoning with such a child. The comparison with the older brother was an insult to Tommy. Fortunately, she didn't allow her mistakes or Tommy's behavior to bother her. She didn't indulge in the typical "impulsive" behavior such as fighting back. Her agreements with Tommy's threats were good examples of unexpected behavior and undoubtedly disarmed Tommy somewhat. By combining all of this with firmness and self-confidence, she was able to accomplish her task as well as to win Tommy's friendship and respect.

Illustration 2.—Minimum of talk

One day an orthopedic surgeon asked me to raise the level of the table. After pumping it as far as I thought he needed it, I said, "Is that high enough?"

He said, "What's the matter, are you tired?"

I said nothing but raised it slightly higher until he said, "Enough."

Since this man had a reputation for being hard to please, I felt the less said the better. Actually, having worked for him many times before and since with no complaints, I felt that perhaps he may not have been feeling his best. Had I made a retort, things probably would not have worked out so well since.

This anesthetist had learned when not to talk. She is to be congratulated on basing her action on her successful experiences with this surgeon rather than the undesirable reports of others concerning his reputation. She emphasized his strengths and gave him the benefit of doubt when he appeared to misbehave.

To digress for a moment, this illustration as well as the majority submitted, refers to the "bad" reputation of the people in question. So-called *reputations* are notoriously unreliable. S e l d o m are they based on facts. Rather, they are usually based on the biased perceptions of other people. Anesthetists who have confidence in their ability to relate effectively to others, have no use for such information. It will be recalled in our first illustration that the anesthetist had no use for the adverse reports. Those who think they need such advance information invariably misuse it. If in no other way, it often lowers their effectiveness by increasing their anticipation of defeat. It is assumed throughout this presentation that it is unprofessional to pass on such information as well as to listen to it with any intent of using it. It is much better for all concerned to approach new human relations situations with a fresh start and an open mind. It is not uncommon for a new anesthetist to avoid trouble with the so-called "problem" surgeon. The next illustration is a good example.

Illustration 3.—Humor that worked.

When we recently acquired a new anesthetist it was decided to assign her to our "problem" surgeon as soon as possible. Even under the scrutiny of this "doubting Thomas", she performed beautifully until a real problem patient (extremely obese, heavy smoker and drinker) was scheduled to have an emergency appendectomy. The patient was p o o r l y prepared and certainly would have been difficult for any anesthetist.

As we all know, the peritoneal closure is the acid test. When relaxation was not at its best and a 20 cc syringe of Pentothal smashed on the floor, the surgeon exclaimed, "How can you be so stupid!"

The poor anesthetist muttered, "Believe me it isn't easy."

Since she had worked in a quiet manner and had tried valiantly to do her best this retort completely disarmed the surgeon whose sense of humor sent him into roars of laughter.

Since this episode both the surgeon and the anesthetist work well together.

Illustration 4. — Recognizing what a person does well.

Occasionally it is necessary for our staff anesthetists to remain on duty longer than the usual eight hours on days they are not on call. There is no compensation for this in either time or money, and recently the times that one must stay on have become much more frequent. The anesthetist on call does not cover these late cases because she is needed to cover another service.

One afternoon major surgery was being performed on an elderly, poor risk patient. The surgeon took his time and it was quite late before he finished. The girl administering the anesthesia had been u n d e r considerable tension, and was becoming provoked with the lateness of the hour.

When the case was terminated I offered to take the patient to his room and told the anesthetist she was free

to leave. As I put the patient into bed I noted that he had reacted completely and all vital signs were good. The course of the anesthesia had been conducted extremely well, and the patient was in excellent condition.

Not being on duty the following day, I would have no opportunity to tell the girl, so I left a note on the desk in the office where she could find it the next day. That girl has never complained again about the long hours required at times and she has seemed to try diligently to be friendly and courteous to a greater degree.

This anesthetist has discovered one of the most effective techniques of encouragement. It is to be distinguished from paternal or moralistic praise; it is merely honest recognition of work well done. It is emphasis on what one can and does do rather than mistakes and what one cannot do. A humble "thank you" or "pat-on-the-back" from surgeon and anesthetist alike often accomplishes miracles in preserving sound human relationships.

Illustration 5. — Creative talk and optimism.

One of our surgeons, in particular, is very much on the defensive. I have noticed that if I start talking about his home and the new fence he's building, golf or any number of other pleasant subjects that he is quite happy and everything goes well. On the other hand if some member of the team mentions distaste for the type or length of the operation, the surgeon becomes quite morose and nobody can please him. It isn't possible to be a Pollyanna all the time but I believe that an optimistic viewpoint is helpful to all concerned—including myself.

Even if one's optimism proves to be wrong, there is little to lose. It is amazing how contagious it is. Many a "problem" surgeon, when surrounded with sincere optimism, has discovered to his surprise that he can work well with nurses after all. This is illustrated in the next three situations also.

Illustration 6. — Action speaks louder than words.

Sometime ago, a rotating resident program was started in which our residents spend some time in a nearby university hospital. In turn, their residents receive experience in our hospital. The director of the anesthesia department at the university entertains very definite anti-nurse anesthetist ideas and doesn't hesitate to indoctrinate the surgeons concerning what he calls our "lack of ability." When the university residents first came, they were very distant, had no confidence in us, and weren't slow in letting us know they were accustomed to anesthesia by anesthesiologists!

We decided, difficult though it might be at times, to say nothing and give no answer to their annoying remarks. Instead, we agreed to continue in our usual way, using the "show them" routine instead of the "tell them."

Before long, there was a change in their attitude and the caustic comments stopped. Now, they not only tell us that they can appreciate good anesthesia, they tell everyone and have gone back to the university, singing our praises and asking why they can't employ nurse anesthetists there.

We're reasonably and justifiably proud in believing we've helped erase some of the adverse thinking about nurse anesthetists. These are young surgeons, soon to start their own practice and they are showing a real interest in the availability of nurse anesthetists when they'll need them.

Illustration 7.—Respect for difference.

We had a new doctor come to town. He seemed very unfriendly it seemed to everyone, doctors and all. His work was beautiful, although everyone disliked working with him because he was so critical. I discovered one day that he had asked for me to give his patient the anesthesia. I took courage and very quietly praised the appendectomy and his method of doing it. It was very different from the way the other doctors did theirs. To my surprise he started explaining all about his procedure to all of us and it seemed to help

everyone relax a little. He now smiles a little and I think he feels we are his friends.

Illustration 8.—The power of kindness.

After an adamant surgery resident started working with us, things became very strained and difficult. Nothing seemed to please him. After about a week of this, our head nurse said, "Either he and I are going to get along or I'll quit; and I am not going to quit on account of him. I'm going to kill him with kindness!"

So she and the rest of us "ganged up" on him. We were very polite and extremely anxious to help. After about a month of this treatment, instead of bellowing, "Blankety, blank, b l a n k . . . ." he would say, "Miss . . . . ., would it be possible to sterilize such and such?" or "Would it be possible to have such and such catheter?"

In the end, people liked him, he became quite human and actually had a sense of humor. It is difficult to remain negative to a kindly and helpful response.

Illustration 9.—Natural consequences.

One day I gave an anesthetic to a nurse for a small orthopedic procedure. I returned her to her room after the operation, since she was reacting well and her sister, who was also a nurse, was there to care for her.

Some twenty minutes later, while I was eating my lunch, a new resident who had been on the case confronted me about the patient. In the presence of a lot of other medical personnel he belligerently wanted to know who decided which patients went to the recovery room and why had I not taken his patient there. I explained our policy regarding the recovery room. My answer that the patient was nearly awake and had her sister to care for her did not seem to satisfy him. One fault finding comment after the other continued to ensue. Finally, I said, "Dr. G. . . . just what is it that you want me to do for you?"

He replied, "I want her to go to the recovery room immediately."

Without further comment I left my lunch and with the help of an aide returned the patient, amidst her protests, to the recovery room. She was completely awake and I know she was taken back to her own room shortly thereafter.

Since that time I have had numerous occasions to work with this young resident. We have never had any further disagreements and never since has he questioned my judgment regarding orders or anesthesia care of any patient. I confess I had to force myself to be nice to him for a time because I did not appreciate his attitude. I feel I won his respect though, because I refused to argue with him or to question his judgment; and even though I had to inconvenience a patient and myself to carry out a seemingly useless order.

Here again is a good example of knowing when to talk and when not to talk. Even though the anesthetist explained a little too much, her explanation was factual and she caught herself before becoming too defensive. She changed her talk to a direct and short question. She showed respect for authority and stopped trying to do the impossible by fighting it. Instead of further talk, she moved into action relying on the situation for results. Even at the risk of irritating a patient, she followed through. The tremendous effectiveness of natural consequences compared to occasional v e r b a l victories or complaints to higher authorities is well illustrated in this report.

Illustration 10. — Humor with reality.

I recall a case with a neurosurgeon. This doctor was in the habit of brow-b e a t i n g every one in the operating room. Several of the anesthetists had said that they wouldn't give an anesthetic after the first time. Since I had been forewarned I knew what to expect. As soon as I put the tourniquet on the arm, he started asking if I couldn't stick the patient or if I wanted an interne to come do it for me.

He stomped around until I had had enough. So in a very mild tone, I said, "Doctor, if you will look at the beautiful scenery out that window, we will have this show started very shortly."

Without further comment he did just

that. Everything went off smoothly and from that time on we were good friends and his attitude was quite different, both to the operating crew and anesthetist.

One can sense in this report the calmness with which this anesthetist worked. She wasn't bothered and she didn't act impulsively. When she did talk, she was able to add a touch of humor. As to the value of the forewarning, it could have caused a more excitable person to become more upset and to resort to too much talk or a poor brand of humor. This anesthetist doesn't really need advanced information in order to relate effectively.

Illustration 11. — Too slow for the surgeon.

While anesthetizing a patient for a nephrectomy, I had encountered some difficulty with a drop in blood pressure. This was not unusual for this surgeon as he placed his patients in an extreme position, which often affected the blood pressure even before the anesthetic was started.

This being an intravenous anesthetic, the surgeon noticed it was taking me longer than usual. He asked if I was having any difficulty. I told him that as soon as she was placed in this position her blood pressure dropped and since I had started the anesthetic it had continued to drop slowly.

He waited a few moments then said, "May I start?"

I answered, "Her blood pressure is still dropping, so I am giving it rather slowly. She is not relaxed enough to start."

He answered me with this, "To H— with the blood pressure. I've got to get started, let's get her relaxed."

Silence prevailed in the room for a moment and then he said, "How is her pulse?"

Without looking up I answered, "That's gone to H— with her blood pressure."

Again silence prevailed. Then he said, "Miss P., would you like to have her straightened out a bit to see if her blood pressure will respond."

I answered, "Please."

This was done and in a few minutes the blood pressure was rising and I proceeded in relaxing the patient.

This was three years ago and I have had many cases for him since, but never since has he showed impatience in the time it took to relax his patients. In fact I enjoy giving anesthetics for him because of his cooperation.

Here again was calmness and subtle humor. It was timed perfectly and was *not* used at the expense of another person. It would be difficult to interpret this humor as sarcasm or humiliation. There was ingenuity here and a real flare for unexpected but most appropriate action.

However, humor can do more harm than good even in experienced hands. As effective as it is when properly used, it is by no means the answer to improved human relations. It should be used with caution at the right time in the right place. The next situation is an example of failure to use humor properly.

Illustration 12. — Humor that backfired.

I was giving open drop ether to a child for tonsillectomy for an old-fashioned, "set - in - his - ideas" surgeon to whom I was practically a stranger. His practice of giving no sedation even to big children shocked and annoyed me but I was trying to "go along" until this could be improved gradually. The child suddenly threw out an arm and knocked the ether can to the floor. I had to hold onto her so could not retrieve it myself, grabbed another and continued the anesthetic. The surgeon began lamenting about the explosion hazard now created (ether was spreading over the floor) and at last my irritation overcame my determination to be good-humored and I said, "Oh, we use ether to clean up with all the time, you know."

He became indignant and went on even more about how dangerous that was to spill ether, etc., and I realized immediately that I had built a little wall between us by that momentary

show of resentment, and increased the difficulty of my task of winning him over to proper preanesthetic preparation of his patients.

Even though this experience was a failure, it should be no cause for alarm. Anesthetists, of all professional people, must find the courage to live with an occasional mistake and a few frustrations. A mistake, rather than something to fear or dread, should be an invitation to start again with renewed dedication to serve mankind.

The important point in this situation was that the anesthetist realized her mistake and rather than brood over it, realistically faced the difficult task ahead. The same anesthetist had the following successful experience.

Illustration 13. — Talking calmly and pleasantly but with confidence.

I had anesthetized a patient for perineorrhaphy and after a few minutes of working and some low conversation with his assistant the surgeon embarked on vaginal hysterectomy, unknown to me. The patient became spastic, held her breath, seemed to require an unusually large amount of anesthetic, and her blood pressure rose abnormally high. After fussing with her a while and never being satisfied with the anesthetic course myself, it dawned on me what the reason was. I said, "Are you by any chance taking out the uterus?"

"Yes, we decided to — she has bad prolapse, etc."

I felt a strong impulse to say exactly what I thought of such thoughtlessness of anesthesia requirements, but I kept silent. After the operation was over and patient was safely delivered to recovery room, I approached the surgeon in his lounge and said pleasantly, "Doctor, the reason I had trouble with that patient was that she was not properly anesthetized for a procedure as stimulating as vaginal hysterectomy. Hereafter, when you decide on a different procedure will you let me know? I realize that you have a good many things on your mind at a time like that, but it is important in order for me to give you good help. I can give you good help if you will let me be a member of the team."

I said this in a low voice so no one else would hear and smiled pleasantly. The doctor replied that he would do so, was sorry, and that I had given him good help. He has shown much more awareness of the need for cooperation between anesthetist and surgeon since that day.

She is to be complimented on the tone and the manner in which she conversed with the doctor. It was done with finesse. There are many occasions when an anesthetist needs to take a stand. One can be authoritative without being authoritarian. Many a life has been saved in the operating room because an anesthetist has had the courage and confidence to make a statement of fact or a suggestion. Many of the remaining illustrations demonstrate this well.

Illustration 14. — Nothing ventured, nothing gained.

At 11 A.M. two surgeons did an emergency laparotomy on a large man weighing 288 pounds. That afternoon, at 3 P.M. he became ashen in color, pulse was rapid and thready and temperature remained 104 degrees as prior to surgery.

The nurses in surgery were told to get ready immediately, that the man was hemorrhaging. He was placed on the operating table and the surgery team was scrubbing. In preparing the patient for anesthesia, I felt his breathing pattern was not as it should be.

First, I checked his arterio-capillary return with my thumb on his forehead, and found it to be very sluggish. Then I rested my elbow on the patient's pillow, placed my arm and hand on his right chest, and then on his left. No chest motion could be determined on the right, and only fluttering, inadequate exchange on the left.

At the risk of criticism for delaying such a situation, I said to the senior surgeon, "Doctor, I wonder if a chest x-ray would help?"

Under mental protest, he permitted it and found an atelectasis, with com-

plete collapse of the right, and almost complete collapse of the left lung. A tube was inserted, and a large mucus plug removed from the bifurcation of the trachea.

The patient made an uneventful recovery.

Since that time, to the point of embarrassment, when anything comes up, the senior doctor of the two who operated, always says, "Get Miss ....., and don't underestimate her seventh sense. Remember the man she saved for us." And he means it.

One can call it *seventh sense* but, more than likely, it is just authoritative good sense based on knowledge as a result of continuous learning and the ability to solve problems gained from years of dynamic experience.

Illustration 15. — Controlled talk and feelings.

The following experience made a lasting impression upon me.

The case was s i m p l e — a D.&C. However, the patient was short and quite obese with a thick neck and small chin. Her veins were difficult to find; therefore, I considered myself fortunate in getting an I.V. started without too much trouble. I intended to use Pentothal, Nitrous Oxide and Oxygen.

Everything was going along nicely, the induction was smooth and the operative site was prepared and draped. Then, unknown to me, the surgeon used towel clips in the skin to hold the towels. I wasn't prepared for this (it was the first time I had ever seen this done). Of course the patient practically lifted herself from the table, the intravenous needle became dislodged and the fluid infiltrated, and I was worrying about laryngospasm. Another doctor restarted the I.V., and again the fluid infiltrated, so I was unable to give more Pentothal. As the cautery was to be used, I couldn't use Cyclopropane. For a few minutes there was much avoidable worry and confusion. The towel clips were removed, the patient was eventually controlled and the procedure completed without too much trouble.

I must admit I made a few pointed remarks, but did make an effort to control my temper. However, I was very upset and the surgeon knew it. I was haunted for some time by visions of that huge woman having a spasm and an anesthetist with not an I.V. in sight. I might add I now ask about the use of towel clips and prepare the patient accordingly. I had a l w a y s thought this type of draping could be accomplished without them, in fact have seen it done that way many times. At least I learned the hard way that there is "another way."

It would take an extremely mature and calm person to experience this situation without a show of temper. This anesthetist was certainly entitled to a few authoritative remarks even though the natural consequences of the situation were sufficient to bring about a few changes in behavior. Talking and temper seldom help and, in many cases, cause the doctor to defend his procedures rather than change his behavior. The anesthetist was fortunate in this situation to have natural consequences on her s i d e without the consequence of death.

Illustration 16.—Life or death reality.

After starting a case one morning, I noticed the Scrub Nurse wasn't quite ready and the Circulating Nurse was bringing in some hot instruments from the autoclave. The patient was prepared and draped and we were ready to start surgery. I heard someone say something about ether but didn't pay too much attention to it at the moment, as I was working with my patient. To my surprise and horror, I looked up and the Circulating Nurse was pouring the ether over the hot instruments to cool them. I requested her to stop and then asked them if either of them had ever seen an explosion or been in one.

In surprise they answered, "Why, no."

I said, "As long as I am in this OR suite I don't want to ever see that again." After the case I told them about an explosion I had experienced and they were very grateful and said that they didn't stop to think about the explosive part; they were just trying

to get the instruments cool so the doctor wouldn't get upset.

There certainly was need for authoritative talk here. When there is danger of an explosion, one does what he can do to remove the danger as well as to prevent it in the future. It was good insurance in this situation for the anesthetist to follow up her demands with a calm explanation of explosion hazards. Such an approach seldom fails to gain respect.

Illustration 17.—Not holding a grudge.

One day a surgeon gave his patient a spinal anesthetic and I was to sit with the patient. Four minutes after the spinal was given, he turned the patient on his side. I was checking the blood pressure frequently when he asked me to leave the room to get something which wasn't necessary in the first place. I refused to leave the patient so the surgeon asked me to leave the room and never come in his room again. I left the room without saying anything. A couple of months later I was the only anesthetist on call when he had a case in the afternoon, so I made up my mind that I was going ahead with the case without making a scene. I just went in and did the case as if nothing had happened before. He was very nice and has been since.

In a subtle way, this nurse was taking a stand. She was wise not to talk. She put her professional responsibility as an anesthetist first. However, on the second request from her superior, she respected authority and left the operating room. Yet, as frustrating and humiliating as this experience was, she had the courage to start again. The ability to forget the past and to move into the future with no grudges is almost a necessity for improved human relationships.

Modern psychology does not hold that man is a victim of his past but rather that he has something to say about his destiny. A "problem" surgeon today is not necessarily one tomorrow. To be more specific, an anesthetist who has trouble with a surgeon today does not need to have trouble tomorrow. She can do something about it. *She can change her behavior*. While the change is usually in the nature of an experiment, nevertheless it may be the very reason why such a surgeon is no longer a "problem" tomorrow.

Illustration 18. — Willingness to cooperate.

A new neurosurgeon had come to town and being the first and only one in the city it was most difficult working with him because of his vile temper. He always seemed to work late afternoons or nights and anesthetists refused to work again with him. So the next day when he came up for his instruments, I asked if I could speak to him. I started by asking him his side of the story as to why these girls would give no more anesthetics for him. To sum his story up, he wanted only the chief anesthetist. I told him it was impossible for me to work four or five hours nights besides my own "call" nights and it would be unfair to the other anesthetists who were equally qualified, but I would take him daytime until we learned his technique and peculiarities. This worked out O.K. and he accepted any anesthetist after that.

This is an excellent example of calm but sincere discussion of the realities of a situation. Facts alone presented in a straightforward manner often prevent conflict. The anesthetist was wise in listening first. It was very effective when she offered her services during the day.

Illustration 19.—Speaking frankly but courteously.

One day I was assigned to a surgeon who was well known for his criticism of everyone during an operation—usually without reason. This day, besides the regular operating room team, we had visitors. Although the patient was

in very good condition, and completely relaxed for abdominal surgery, he was most critical of the lack of relaxation, and the "pushing." His criticism continued throughout the time the abdomen was open. I said nothing, except that I was sorry, and would see if I could get the patient deeper.

Following the surgery, I was seething! I purposely stayed out of the way of the surgeon until I could get myself under control. He sought me out and IN PRIVATE apologized for his actions in the operating room. I accepted his apology without a sarcastic answer.

A week or so later this same surgeon asked me to give an anesthetic for him. When he asked me, I answered, "Not if there is anyone else available to do it."

He asked why, and I told him, that I did not like to be belittled in public by a surgeon, or anyone else, and then have that person apologize in private for his actions.

We became firm friends. I was consulted about difficult cases, agents, dosages, and many other things from then on, and gave several anesthetics for him afterward that were perfectly satisfactory to him.

This anesthetist used the effective technique of talking about how she felt and how she was planning to act rather than the typical technique of watching what others are doing and talking about how they should change. Combined with calmness and firmness, she succeeded in changing an intolerable situation into a pleasant one.

Illustration 20.—Empathy but taking a stand.

There is a pediatrician on our staff who always attends his patients in surgery. At times he can be overbearing by telling both the anesthetist and the surgeon how to perform their duties.

I had heard about him many times and I hoped to be prepared to deal with him if and when I ever gave an anesthetic to one of his patients. He had discussed a case with me about three weeks before surgery and we had agreed on the procedure. It was an eye surgery case. For these I have always used intratracheal anesthesia. The night before surgery he called to discuss the anesthetic. I listed for him the agents I would use (omitting the agents which he bitterly opposed) and said that I would use intratracheal technique. He very abruptly said, "No, m'am, you will use drop ether and not intratracheal."

This is generally the point where most anesthetists and/or surgeons had abruptly told him to take care of his business and sparks would generally fly. I took a deep breath and very calmly explained that I appreciated how he felt but "in order to have complete control over the patient's respiration at all times and to be out of the surgeon's field so as to not contaminate the surgical field it would be necessary that I use intratracheal technique."

Much to my surprise he very pleasantly said, "You are exactly right. I had not thought of it that way."

We met in surgery the next morning and he was very friendly. All went well and he complimented the anesthetic.

Here again is an excellent example of how advanced adverse information can place a person on the defensive and, at times, literally invite defeat. This anesthetist was able to place more faith in her ability to relate effectively than in the failure of others. Instead of the typical impulsive behavior, she found another way and it worked.

Illustration 21.—Proper use of responsible people.

Recently we had a tense day or two. This involved a senior student within one month of graduating. I was intermittently supervising this very good student while she gave the anesthetic to an elderly poor risk cardiac patient for radical surgery. It so happens the heart was monitored with an audible monitor. The patient developed more marked irregularities of the pulse and the blood pressure fell precipitously. The student immediately called for me and in the next breath she told the surgeon, a house officer, of the situation. An associate anesthesiologist got there first followed by myself and the anes-

thesiologist-in-charge. Prompt measures were taken to reverse what appeared to be an imminent cardiac arrest. After a fairly stable condition had been re-established for the patient, the surgeon and his assistant berated the student and myself for not notifying the surgeon before calling for help. The student and myself kept still and made no reply. The case was completed and the medical anesthesiologist took this matter up with the surgeon. The student was able to discuss this case later with the surgeon and assistant involved. While neither of us felt too kindly toward these two for a day or two, relationships continue as usual and we work amicably with the same personnel. My own reaction toward the student was that she had not been at fault. The surgeon could hear the cardiac rate and rhythm and knew the risk was great for this patient. The anesthesiologist-in-charge also supported the student.

Regardless of one's ability in human relations, there are always situations in which it is best to refer or delegate to a more responsible person. Even though this anesthetist kept quiet, it was not enough. Graduation could have been involved and that was something determined by other people. She was wise in obtaining the help of more responsible people. They were able to be more objective. As indicated, they supported her with the authority that went with their responsibilities. Giving the student an opportunity to discuss the case later with the doctors involved was certainly an excellent procedure. While it is often a last resort to appeal to responsible people with authority, there are many situations in which it is the most effective thing to do. Some situations even require an "outside" arbitrator. Regardless, if the people involved will sit down together for a reasonable length of time and discuss the pertinent facts, decisions and opinions, almost any human relations conflict can be alleviated.

Summary

Twenty-one actual experiences and comments have been presented. The wisdom of minimum talk and minimum involvement in conflict situations has been illustrated repeatedly by anesthetists who have learned to extricate themselves from the power of people who misbehave. There have been many examples of the encouraging effects of offering a choice, recognizing what people do well and trusting fellow human beings. Considerable ingenuity has been displayed by anesthetists through the subtle use of humor and the effective use of unexpected, yet ethical, behavior. Over and over again the nurse anesthetists who participated in this project have demonstrated a high degree of self-confidence and the courage to take a professional stand when circumstances warranted it.

However, there is no implication that the illustrations or comments are "answers" for conflict situations. Rather, they are presented as suggestions for experimentation. If they appeal to you, it is hoped that you will try them out in your own unique way in your unique human relations situations. If, as a result of your experimentation and learning, you improve your ability to relate to people, you will be a greater asset to any surgical team as well as your profession and this cooperative venture of AANA will have served its purpose well.

The Role of a Nurse Anesthetist in a Hospital Safety Program

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The usual role of the nurse anesthetist in relation to safety programs is anesthesia service rendered after an accident has occurred. Whether the accident happens outside of the hospital or within the hospital has little bearing on this service. However, when the accident occurs within the hospital, the staff members who are involved in the care of the patient are consciously or subconsciously aware of a paradox: The center of health has become a site of danger!

Some members of the staff are satisfied to wonder; others are prompted to do something to prevent recurrences of the mishaps. It was with a wish to help find the causes, and with the hope of lowering the accident rate in The Methodist Hospital (Dallas, Texas) that I accepted an appointment to the Hospital Safety Committee in 1957. The nurse anesthetist has only to look around to find many opportunities to teach safety in a hospital program. In fact, hospital department heads are not only willing, but anxious, to have their employees receive any instructions that will assist in eliminating accidents.

The purpose of this paper is to tell you of some of the experiences and duties of the committee, to show some of the results of its actions, and particularly to point out the role that may be taken by the nurse anesthetist in a hospital safety plan.

The Committee

Members: The Safety Committee at Methodist Hospital is made up of ten members. The members are selected by the administrator from the staff. The chairman of the committee is the chief engineer who is in charge of hospital maintenance. His is not only a "presiding at meetings" chairmanship, but a "do-something-about-it" chairmanship. The committee reports to him and he in turn is responsible to the administrator for correcting hazardous conditions or defective equipment. Departments represented on the committee are: Dietary, Housekeeping, Laundry, Nursing Service, Educational, Public Relations, Personnel, Administration and Anesthesia. Other departments could, and often do, have members

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on Safety Committees but at present a member from each of these is active on our Committee.

Duties: The Committee operates according to a plan that keeps all members of the committee aware of the problems, alert to the hazards and informed of the results of its efforts.

A meeting is held each month to hear a report of the secretary on any accidents that may have occurred in the hospital during the month. This report includes the nature of the accident and the department in which it happened. The committee then discusses the cause of the accident, determining whether other similar accidents have taken place at the same site. If there have been repeated accidents in the same place, or involving the same people, the committee searches out the possible cause. When a cause is found, steps are taken immediately to correct the hazard or to instruct the people involved.

The committee receives a report from the chairman of the action that was taken in each case, whether it was a first-time accident or a repetition. Some of the recommendations of the committee may be for warning signs to be placed where accidents may happen to the unwary, or for lights to be placed in shaded hazardous locations. A rubber mat placed on a slippery floor, or handrails for support, may prevent recurrences of falls.

At the committee meeting, department heads are assigned the responsibility for following through on suggestions for correcting dangerous practices or locations.

Although the safety-conscious hospital staff is alert to the dangers of defective equipment, the Safety Committee makes "grand rounds" every three months. Every room and corridor, closet and stairway is inspected in the search for possible defects. Orthopedic equipment, storage rooms and racks, electric wiring and devices, plumbing, floors, overhead equipment, beds, chairs and cupboards are thoroughly checked. In this way the committee locates the possible sources of trouble. Recommendations are made for immediate correction of any hazard.

A third, and probably the most important, function of the committee is one of education. Aside from the education of its own members, the committee works with department heads, patients, visitors and staff members, to educate them in safe practices.

Experiences

Accidents happen to people and are sometimes caused by people. In the hospital we are concerned with three main classes of people: patients, visitors and staff.

Patients: At Methodist Hospital, a record for 1957 shows that of 408 accidents reported to the committee (and we believe that all accidents were reported), 174 (43%) involved patients. Ludlam, in reporting the experience in California hospitals, presented statistics on incidents and claims involving patients. Although our experience does not include all categories as listed by Ludlam, we are listing his categories here as representing a larger experience from which we may learn the wide range of hazards to patients.

"Out of bed—over rails
Out of bed—no rails
Out of bed—ambulatory
Accidents in bed
Surgery and delivery incidents
Medication errors
Needles lost

Sponges lost
Burns
Equipment accidents
I.V. infiltrations
Injections—injuries
X-ray department incidents
Baby identification errors
Personal property—lost or damaged."

Visitors: In 1957 only 19 (4.6%) of the 408 incidents reported involved visitors. This smaller number is understandable since visitors are in the hospital a relatively short time compared to the patients or staff. Emotional strain, caused by concern for the patient, and unfamiliarity with the hospital environment are probably the greatest contributing causes of accidents to visitors. Polished floors, wet floors, greasy spots in driveways or parking lots, are pitfalls for the stranger. The wheelchair, cart or other moving equipment coming from blind corners may collide with the unsuspecting visitor who has not been warned of the possible danger. Signs, mirrors or floor markings may help the visitor to avoid traffic accidents within the hospital.

The Staff: The staff members working in the hospital are the people most often injured in the hospital. Workers in certain departments of the hospital are more often injured than workers in other areas. In the Methodist Hospital, the nursing service reported the greatest number of incidents involving personnel, the dietary department and maintenance departments being second and third in order of number (not necessarily the severity) of accidents.

No member of the staff is immune to accident in the performance of his duties in the hospital. As a member of the safety committee one feels one is not only providing safety for the patients but for his fellow workers as well. The most surprising reaction occurred when I approached the chief X-ray technician about an accidental death that had happened in the X-ray department the previous day. He was most anxious for suggestions, but was also extremely interested in having me teach his staff many things that one might consider minor. Because we are often so familiar with these little things, we forget that other people may not know. For instance: What to do and what to expect when an anesthetic is required in the X-ray department; How to administer oxygen until help arrives; What to do when someone faints, or suddenly starts vomiting when lying flat on his back having X-ray pictures made. The X-ray department members appreciated the many suggestions for moving patients from cart to table, and from the department to the patient's room. Since the X-ray and surgery departments are on the same floor in our hospital, the anesthetists do most of the venipunctures on children. These contacts, as well as the times we are in the department giving anesthetics, give us many opportunities to share our experiences and to make suggestions for safety. It is also a good public relations contact.

The number of accidents has been greatly reduced since the inauguration of our Safety Program. Table number 1 represents experience during 1956 and 1957.

An example of how a small change in procedure may effect a large improvement in accident rates is our experience with broken glass. Throughout the hospital there is glass broken, sometimes accidentally, and often in the course of opening glass-

enclosed medicines. Before our emphasis on this problem, persons who handled trash baskets in which broken glass was placed with other discarded materials were often cut, sometimes severely. The Safety Committee has changed the procedure. Now separate containers for broken glass are available in all departments. The number of cuts has decreased from 50 to 75 per cent since this system was established. Another example of how a small change in procedure may affect a safety program was our problem of having personnel on the divisions cutting or skinning their hands or fingers with paper files. This did not occur in the business office where one would expect it to happen more often. The safety committee watched with interest this consistent cutting of hands from month to month, and decided it was not a matter of education on the part of nurses and ward clerks, but a lack of respect for the sharp pointed paper files. One of the committee members suggested a different type of paper holder, but the people working with them did not like the new paper holders and continued to use the old type paper files. Reports on punctured hands continued. Finally, in desperation, someone suggested bending the point over, so the sharp point would not be exposed so much. This was done several months ago and we have since had reports of only one punctured hand from this cause.

Table 1

Department	1956	1957
Business Office	3	5
Central Supply	0	0
Dietary	27	24
Housekeeping	17	17
Laboratory	1	2
Laundry	3	2
Maintenance	16	18
Palm Grill (cafeteria and gift shop)	5	4
Purchasing	0	1
Medical Records	1	3
Nursing Service	72	98
Student Nurses	21	33
House Staff	1	2
X-ray	1	1
Clinic	0	1
Patients	173	174
Visitors	25	19
	366	404

Another place that the safety committee has helped to cut down accidents is in the laundry department. When the laundry is sorted each morning, any broken glass, syringes, pencils, needles, razor blades, or any thing other than soiled linen that is found to have been thrown down the chute, is collected and placed on display for everyone who may have been responsible to see. This practice has worked amazingly well. The laundry department now seldom has any foreign materials sent down the chute with the dirty linen. As a result of this, fewer and fewer cut or punctured hands are reported each month.

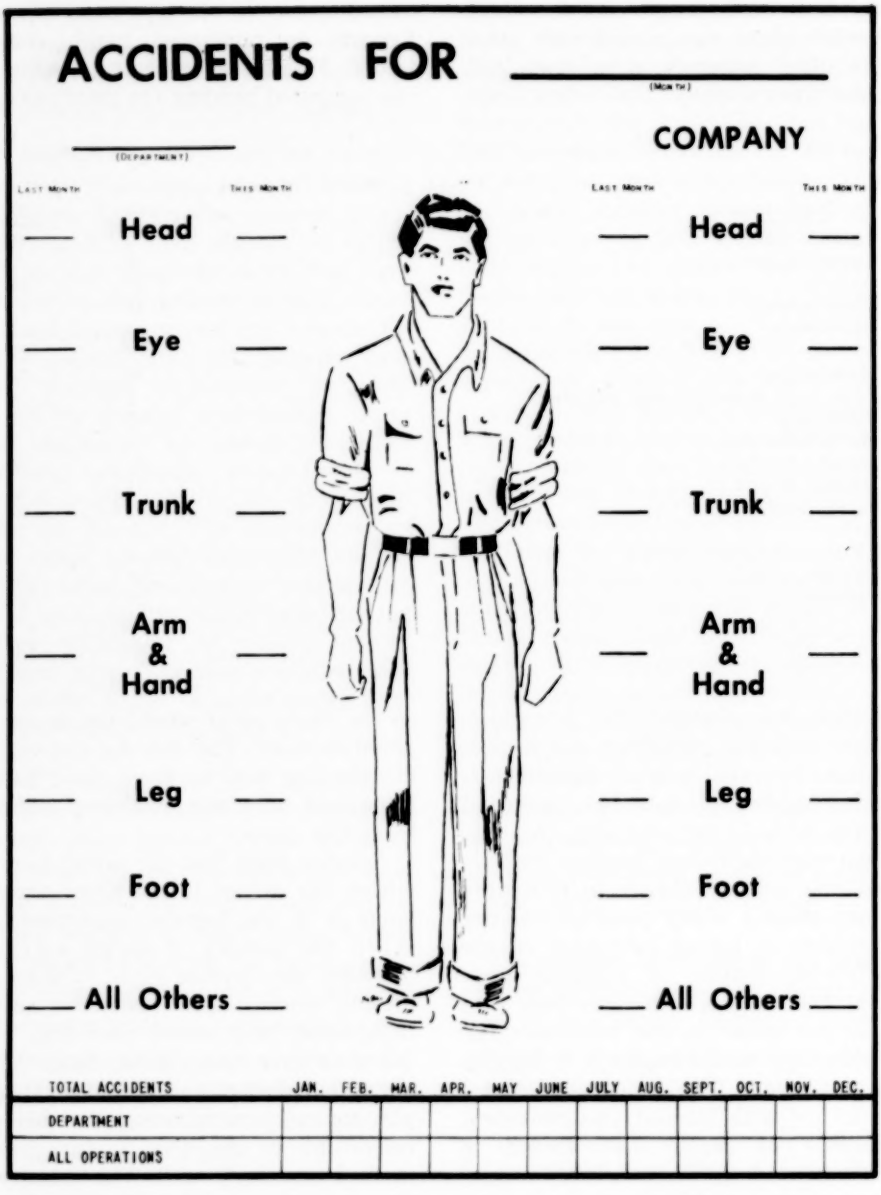

Figure 1. Chart upon which sites of injuries are reported to department heads each month by Safety Committee at Methodist Hospital, Dallas, Texas.

Report of Accident

Each incident involving hospital personnel, patient or visitor, is reported promptly and in detail to the department head who in turn reports it to the administration business office, public relations department and the secretary of the safety committee.

A picture-report (Figure 1) is sent to each department each month. In this report the accident experience is compared to the experience for the preceding month. A sense of department pride in improvement is encouraged by this comparison.

Nurse opens vial over broken glass container.

Aide discards empty glass flask into special container.

Patients who come to Methodist Hospital are given a booklet in which they are "introduced" to the hospital and some of its peculiarities. These alone do not prevent accidents, but we believe that it helps to make the patient and his visitors better acquainted with the new environment and thus indirectly helps prevent accidents.

Reading the reports of accidents in hospitals as they come to the courts for settlement (Hayt, Hayt and Groeschel) impresses one with the importance of accidents from the legal phase. Not only do accidents affect the hospital adversely in matters of law, of insurance rates and of publicity, but they affect the morale and the moral principles of those who work in hospitals.

The Nurse Anesthetist

The nurse anesthetist, by virtue of training in close observation, alertness for hazardous conditions and in instructing others in safety procedures, will readily adapt these special qualities to the larger field of the Hospital Safety Program. I am sure that every anesthetist is familiar with the long, difficult task of trying to teach safety methods, both in surgery and in the obstetrical division. At the Methodist Hospital this task now has become rather simple procedure, since the Safety Committee as well as the Administrator now says what can and what cannot be done in the way of safety practices. Now, rules are

Engineer, Administrator and Anesthetist, members of the Methodist Hospital, Dallas, Texas, Safety Committee inspecting electric wiring.

Patient receives pamphlet from hostess at Methodist Hospital, Dallas, Texas.

carried out, not because the anesthetist says so, but because the safety committee has investigated and found that these rules are the best for the safety of all.

Because the records are now kept in more detail than they were in the past, we are not yet in a position to judge the effectiveness of our present program. That there is a decrease in the number of accidents may be seen by comparing the figures in the following table:

Table 2

Accidents to:	June 1, 1956 - May 31, 1957	June 1, 1957 - May 31, 1958
Patients	77	15
Employees	162	131
Visitors	22	17

The anesthetist who serves on a safety committee should be willing to give of her time and knowledge not only for the people within the walls of healing, but for her fellow workers as well. Those of you who have safety programs know the satisfactions of being a part in forming and being a member of a team whose duties are to watch out for all those people who each day enter our working home.

May I urge every anesthetist, not only to take part in the safety program in the hospital, but to take a part in all hospital programs. It will be a great satisfaction and much knowledge will be gained. But above all, it will be one of the greatest individual public relations contacts the anesthetist can make, and the good will will reflect on the association as well.

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Hospital Safety

Safety in Anesthetizing Locations

Harriet L. Aberg, C.R.N.A.

"What is there to worry about in an operating room as long as the electric plugs are explosion-proof?"

The meaning of the expression "explosion proof" is frequently misunderstood. When a unit consisting of a receptacle, attachment plug and interlocking switch is designated "explosion proof" it does not mean that an explosion can not take place. It does mean that the construction of the unit and its parts is of such strength that should an explosion occur, it would not be shattered and allow the propagation of flame.

If vapor of flammable proportions is in the receptacle opening and the plug is inserted, the electrical contact may cause a fire or explosion. Occurring in approved equipment, the explosion will be "contained" safely.

In connection with the subject of arcing in devices, it is of interest to read that a note to #5 - 10 of N. F. P. A. #56 Safe Practice for Hospital Operating Rooms states, "Attention is directed to the fact that mercury-type switches although producing no exposed spark on operation when in normal condition, are not listed by the Underwriters' Laboratories, Inc., for use in Class I, Division 1, locations unless enclosed in explosion-proof housings."

"Why is it all right for just some of my clothes to be of nylon when I work in the operating rooms or delivery rooms?"

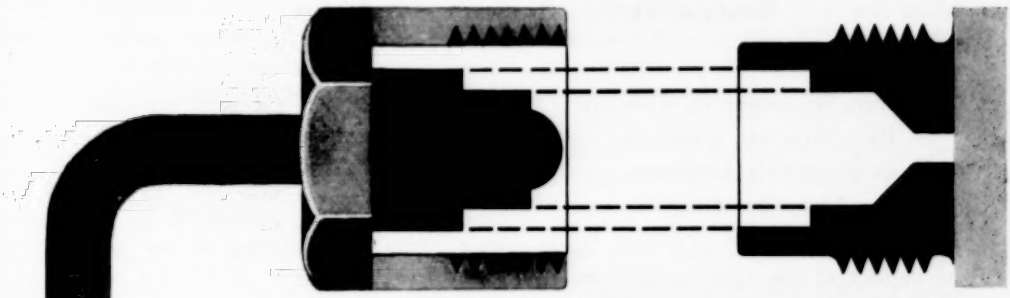
The usual women's hosiery and underclothing of thin synthetic textiles in which the entire garment is in close contact with the skin, will carry the same electric charge as the wearer's skin in a very short time. Therefore, these garments may be of synthetic material.

There is an exception, men's nylon socks are considerably heavier than women's hose and it is possible that the natural moisture of the skin will not penetrate the material and the socks will not carry the same charge as the wearer's skin, therefore becoming an insulator. This is of particular importance in providing a continuous path of conductivity between patient, personnel, equipment, furniture and floor. Such socks could constitute electric insulation of the person from the floor and would negate the careful efforts to provide a conductive path through the shoes to the conductive

(Continued on page 73)

Miss Aberg is A.A.N.A.'s representative on the N.F.P.A. Committee on Hospital Operating Rooms concerned with the National Fire Protection Association's publication #56, Recommended Safe Practice for Hospital Operating Rooms.

D·I·S·S* is it!



* Diameter Index Safety System

what DISS is all about

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DISS was developed by the Compressed Gas Association to further reduce the possibility of human error in the administration of inhalation anesthetics, oxygen therapy, resuscitation and suction.

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DISS-solves <u>your</u> gas interchange problems!

Now all *new* Ohio equipment will meet DISS specifications. Ohio servicemen (recently called into Madison for special training in DISS) will permanently "safe-t-ize" your present equipment. DISS can save a life — it's well worth the small cost for added safety.

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AIRCO

Legislation

Emanuel Hayt, LLB., Counsel A.A.N.A.

Surgeon Required to Explain Presence of Forceps in Patient's Abdomen After Surgery

Plaintiffs, husband and wife, had the verdict of the jury in their malpractice action against defendants, surgeons, for injuries sustained by plaintiff wife as the result of an abdominal operation performed by defendants. Plaintiffs' evidence showed that a Kelly forceps, an instrument approximately 6½ inches long, was left in plaintiff's abdomen. This instrument had to be removed some 14 months after the operation performed by defendants because it had pierced the transverse colon. On motion for judgment notwithstanding the verdict or, in the alternative, for a new trial defendants contended that the evidence did not establish negligence and that the case was improperly submitted under the doctrine of res ipsa loquitur because the presence of the forceps was explained. Defendants offered evidence to show that they failed to locate the forceps because the patient's condition following surgery would not permit a search of the operating area. There was medical testimony that, because of the seriousness of the patient's condition, defendants were not negligent in failing to assure themselves that she carried no foreign body within her. This court was of the view the conclusion was inescapable that defendants were negligent and answerable to plaintiffs in damages, and that the case was properly submitted to the jury under the doctrine of res ipsa loquitur. Defendants' motion was denied.

(Swanson v. Hill, 8 CCH Neg. Cases 2d 1017-USDC-No. Dak.)

Surgeon Guilty of Malpractice in Unwarranted Removal of Female Organs

The surgeon was charged with malpractice and battery in that the surgery actually performed was without her consent and was unnecessary. Plaintiff charged that a nurse, an employee of the hospital, improperly administered an enema which caused a fistula or opening between the vagina and rectum through which fecal matter escaped.

A review of the evidence convinced this court that there was ample evidence to support the verdict. It was undisputed that the condition requiring surgery was a dropping of the uterus. In the course of the operation defendant removed the uterus, a Fallopian tube and ovary. A pathological examination of the excised organs revealed them to be normal. There was further evidence that there were no pathological or clinical findings to warrant the removal of the organs

and that it is not an accepted medical practice to remove these organs when there are no pathological abnormalities. The jury was also warranted in attributing the fistula between the vagina and the rectum to improper surgery conducted by defendant, as he undertook to bear the costs of plaintiff's second hospitalization. Concluding, the court held that the trial court did not err in permitting plaintiff to prove defendant was addicted to the use of drugs at the time that he operated on plaintiff, since there was evidence that the protracted use of the narcotic, methadon, would adversely affect a surgeon's ability to operate. Evidence, however, that defendant's license to practice had been revoked because of drug addiction a long period of time after the surgery herein involved should not have been admitted, but this court adhered to the trial court's view that prejudice did not result from the admission of such evidence. Defendant's final contention that plaintiff's claim was barred by the one-year statute of limitations was rejected by the court on the basis of evidence that defendant concealed from plaintiff the fact that the organs were unnecessarily removed. The judgment for plaintiff against the surgeon only was affirmed.

(Hundley v. St. Francis Hospital et al., 8 CCH Neg. Cases 2d 971-Calif.)

Patient Fails to Prove that Air Embolism in Intravenous Feeding Caused Brain Lesion

While undergoing preparation for an intricate heart operation in which plaintiff's heart and lungs were to be used to sustain the patient while the patient's heart was being operated upon, a bottle of fluid being fed intravenously into plaintiff became empty, allegedly causing an air embolism. Thereafter plaintiff was hospitalized for a considerable time and incurred substantial physical and mental change because of a lesion of the brain.

After a trial, the jury was unable to agree on a verdict and defendants, six of the seven doctors who comprised the operating team, moved for directed verdicts in their favor notwithstanding the failure of the jury to agree. The court granted the motions, ruling that the issues involved were questions of law.

The court held that plaintiff failed to establish negligence on the part of defendants towards plaintiff since all of the defendants were assigned to surgical procedures not connected with plaintiff. It appeared that a certain Doctor X was in charge of the administration of the intravenous feeding, but he was not a defendant in this suit. Since the Medical School had assigned to each of them a specific duty in regard to the operation and had given none of them authority to direct others concerning plaintiff, the court held that defendants were not in a master-servant relationship to the other participants in the operation.

After examining the evidence the court determined also that plaintiff failed to prove by the weight of the medical testimony that the injury was more likely the result of some negligence for which defendants were responsible than something for which they were not responsible. The medical expert for plaintiff testified that he was unable to say positively what caused plaintiff's lesion of the brain.

The medical expert for defendants stated that an air embolism could not cause a brain lesion. Defendants' motions for judgment were granted.

(Thompson v. Lillehei et al., 8 CCH Neg. Cases 2d 1074-USDC-Minn.)

Broken Needle During Injection of Tetanus Antitoxin is Not Malpractice

Plaintiff, a Negro woman 42 years of age, worked as a domestic in and about New Franklin, where she lived. The suit arises from the fact that she developed a severe case of tetanus. On April 8, 1954, she was hit on the head with a metal chair by her husband, in the course of an argument about his drinking. This blow raised a hematoma about half the size of a lemon in the right parietal area: in the center of the hematoma was a clean looking cut about an inch long. She was taken very shortly to the office of defendant, who had long been her family physician, and who was a medical doctor in general practice.

According to plaintiff's testimony she was attended by the defendant on April 8, 10, 13 and 15, and three times on Saturday, April 17; on all of these occasions but the last one she went to defendant's office. She stated that on the first visit defendant did not cut her hair, remove any skin, or "clean out" the wound, but that he separated or parted her hair, put some salve on a pad which he applied to the wound, and then bandaged the wound and head; that he might have used a piece of gauze to swab the wound; and that he also gave her a "shot" at that time. It was further shown without contradiction that the "shot" was an injection of 1,500 units of tetanus antitoxin.

Plaintiff was taken in an ambulance to St. Joseph's Hospital in Boonville at about 2:00 a.m. on Monday, April 19th, and a nurse then notified defendant by phone. He inquired as to her complaints and prescribed a sedative; he first saw her there at about 7:00 a.m. By that time plaintiff was very ill; the nurses' notes show that at 5:00 a.m. she stated that she could not open her mouth. Various laboratory tests were made and medications given, beginning immediately, including a spinal tape to eliminate the existence of meningitis, a skull X-ray, and repeated administrations of penicillin, sedatives and glucose. Two other physicians were called in consultation. Defendant became suspicious of tetanus about 8:00-8:30 a.m., and a diagnosis was made of probable tetanus at about 11:00 a.m. As soon as sufficient tetanus antitoxin could be procured for a large dosage, its administration was begun, actually about 1:30 p.m. This had to be collected at first in many small prophylactic doses from various drug stores in Boonville and Columbia, until larger amounts could be procured elsewhere. About 6:00 p.m. defendant attempted to inject antitoxin into plaintiff's spinal canal; she was placed in an "arched" position to separate the vertebrae; when the needle had been partially inserted, plaintiff gave a "sudden, unexpected jerk," causing the needle to break before it had actually gone into the spinal canal, and leaving the proximal end of the broken portion about a quarter of an inch beneath the surface of the skin. Such accidents are by no means unknown in the medical profession. No effort was made at that time to remove the broken portion of the needle, a piece perhaps six centime-

ters in length. Plaintiff remained acutely and seriously ill with tetanus for several weeks, receiving repeated large doses of the antitoxin intravenously and much other medication; she was unable at the trial to recall much concerning the first weeks of her hospitalization. She received very frequent doses of sodium amytal for pain. The "History and Physical Examination" on the hospital record showed: "onset of neck and mouth complaint, about 24 hours before admission . . . head and neck arched back as in meningitis." Defendant was the attending physician throughout plaintiff's hospitalization and for about four months thereafter. Plaintiff did not go subsequently to any other doctor for treatment. She stated that she first learned of the breaking of the needle from one of her attorneys.

Plaintiff did not charge that defendant failed to possess the requisite knowledge or skill; hence, we are not concerned with that issue. She did charge failure to use and exercise the necessary care and skill, which is a charge of negligence. Therein, her charges were and are essentially as follows: (1) that defendant failed to administer adequate and timely tetanus antitoxin; (2) failed to properly cleanse and treat the wound; (3) failed to make a timely diagnosis of tetanus and to administer proper treatment; (4) failed to hospitalize plaintiff; and finally (5) that he broke off the needle in plaintiff's back and failed to remove the broken fragment or advise plaintiff thereof, and failed to make any notation on the chart.

This wound was not of the type in which the development of tetanus would be strongly suspected; it was an open, cleanly cut wound incurred inside a dwelling house. However, defendant administered immediately the ordinary prophylactic dosage of antitetanus serum. Even after plaintiff entered the hospital, extensive tests and consultations were found to be necessary before a diagnosis of tetanus could properly be made, notwithstanding the fact that the condition had then been developing for perhaps an additional 36-48 hours since defendant saw the patient. On this phase of the case the evidence shows a fair exercise of defendant's best judgment, without proof that the judgment was negligently exercised. We deem it unnecessary to cite again the cases which have already been referred to.

The breaking of a hypodermic needle in the course of medical or dental treatment is by no means a thing which, in itself, bespeaks negligence. Needles may break from various causes, as from an unobservable and unknown defect in the needle, or from a sudden movement of the patient, as well as from an improper usage or method. And such a break may occur in spite of all the care and skill which a physician or dentist may employ.

True, it is ordinarily better procedure to tell the patient; but this must depend somewhat on the circumstances, and here it would not seem to have been useful or prudent to have told plaintiff of the occurrence at the time; in her condition she may not have been able to understand, and if she had done so it could only have agitated her. Likewise, a notation on the chart may be a customary procedure, but the failure to make

(Continued on page 73)

Insurance

QUAESTIO?

Q. Why is it Mr. Maginnis, you keep repeating on the Income Protection part of our A.A.N.A. approved insurance program?

A. Perhaps for the same reason that you keep repeating the importance of the sterile technic. The average lay person or untrained hospital attendant does not believe what he cannot see. Only by continuous repetition and education can the importance of absolute cleanliness be achieved. I have seen and therefore I know what the "continuation of income" can mean to some unfortunate member.

? ? ?

Q. Why do you say "continuation of income" instead of Accident & Health?

A. Accident & Health insurance is only a title or a heading of the many various forms of insurance that are available. However, "continuation of income" is the same type of insurance in action. It really guarantees a salary or earnings of the insured to be continued in the event of a disability through an accident or prolonged sickness.

Q. How is this different from Hospital insurance?

A. Hospital insurance is only a reimbursement or a payment of actual hospital expenses. Income insurance guarantees the salary or earnings of the insured, whether or not the insured is in a hospital. As a matter of fact, confinement to a hospital has nothing to do with income insurance. This plan pays, in or out of the hospital.

? ? ?

Q. Suppose my place of employment has a benefit plan. Should I still enroll in the A.A.N.A. Income Plan?

A. I know of no benefit plan that would pay an income to an employee for "lifetime" in the event of a disability from an accident and at the same time exempt the payment of all future premiums. Most benefit plans are not applicable to every situation. You never "own" a benefit plan. You only share ownership. Your A.A.N.A. program may be continued wherever you work or live. It is your personal plan.

Q. What are some of the specific benefits under our Group Income Protection Plan?

A. A member who is eligible may apply for as high as $400 a month income under this plan. This means that in the event of a sickness the member may collect one full year's benefit at $400 a month. It means that in the event of an accident even for lifetime, the member may collect the same amount of income. In the event of a partial disability resulting from accident the member may collect as high as $200 a month for a period of six months. The plan also includes as high as a $4,000 accidental death benefit. It contains certain medical expenses. The plan also has an optional hospital benefit and most important of all, the plan was designed especially for an anesthetist. A member of the A.A.N.A. may not necessarily be totally disabled in order to collect her continuation or income insurance. She only has to be disabled from his or her own profession. This is important to the members.

Q. Is every member of the A.A.N.A. eligible for enrollment?

A. After 3,000 members have enrolled every member regardless of health (under age 70) may enroll. It is difficult to understand why the many members who are in good health will not assist their fellow uninsurable members. Hundreds and hundreds of A.A.N.A. members are looking forward to the day when they may protect their income savings through this group plan. They depend on you and other members to participate in the plan so they may mutually benefit. Despite the fact that this is the finest income protection plan a member can purchase and despite the fact that the cost is low and despite the fact that through your cooperation we can protect the uninsurable members you still hesitate to enroll — why?

? ? ?

Q. Why?

A. I really don't know why.

John C. Mogensen

Insurance Consultant, AANA

WHY — wait until it is too late?

WHY — take a chance and destroy your savings through loss of income?

PROTECT your savings and income now — through your approved "Income Protection Plan"

WHY — not support a plan that will support you in time of need?

WHY — not join a plan that can help every member, regardless of health?

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Abstracts

Aravanis, C., Libretti, A., Jona, E., Polli, J. F., Liu, C. K. and Luisada, A. A.: Pulmonary reflexes in pulmonary edema? Am. J. Physiol. 189: 132-136 (April) 1957.

"The sudden onset of pulmonary edema has been attributed to either "acute left ventricular failure" or a "vasomotor crisis" within the lungs. Recent investigations have emphasized the paramount importance of a sudden, systemic vascular constriction resulting in a sudden shift of blood from the systemic to the pulmonary circulation. While systemic vasoconstriction is almost certain to occur in experimental pulmonary edema due to stimulation of brain centers, the possibility that vasomotor phenomena in the lungs may be also involved has not been excluded. Our study was undertaken in order to investigate this possibility. . . .

"Thirty-three mongrel dogs . . . were studied. . . . Pulmonary edema was obtained in six pilot experiments in dogs receiving veratrine in the cisterna magna. It is possible that, had a larger series been used, some animals might have escaped edema. . . .

"A comparison between the experiments made with veratrine in the intact animal and those performed after exclusion of most of the systemic circulation reveals striking differences. In intact animals, acute pulmonary edema, accompanied by marked aortic and left ventricular hypertention, followed the injection of the drug while exclusion of the systemic circulation prevented pulmonary edema and minimized the pressure changes. . . .

"The results suggest that the pulmonary vessels can be stimulated to contract by central stimuli and that, in the case of veratrine, the contraction of the veins may be greater than that of the arteries resulting in an increased blood content of the lungs and contributing to the production of pulmonary edema. A similar mechanism may take place also in other types of experimental and clinical pulmonary edema following intensive stimulation of the vasomotor center. This hypothesis requires further elucidation, especially in view of the fact that, when stimuli other than veratrine are used, arteriolar rather than venular constriction seems to predominate in the lungs."

Altman, M. N. and Fialkov, G.: The use of meperidine in peroral endoscopies. Arch. Otolaryng. 65: 221-224 (March) 1957.

"Ideally, the successful performance of endoscopies requires a general analgetic drug whose effect is of short duration, producing adequate muscle relaxation which at the same time leaves the patient sufficiently awake in order to cooperate, and which also has a wide margin of safety in order to be used routinely. Meperidine . . . seems to fulfill these requirements. . . .

"Meperidine seems to us to be a promising agent for the performance of peroral endoscopies. Since the middle of 1954 we have used it rou-

tinely in these examinations. . . .

"Intravenous meperidine in doses from 100-200 mg. was used as analgetic agent in peroral endoscopies in conjunction with local anesthesia. The advantages noted were muscular and psychic relaxation of patients who remained cooperative and reduction of amount of local anesthetic agent. No disadvantages were encountered in 250 procedures. The possible dangers of respiratory depression, which never occurred in this series, can be avoided by slow administration of the drug."

Gershon, S. and Shaw, F. H.: Effects of bemegride on barbiturate overdosage in humans. Brit. M.J. 2: 1509-1514 (Dec. 28) 1957.

"We decided to determine the effects of oral bemegride on barbiturate overdosage in man. . . . The barbiturates studied in the present work were phenobarbitone and pentobarbitone, as representatives of the short and long-acting groups respectively. . . . The subjects used in this investigation were all psychiatric patients. . . . This study was carried out on a total of 58 subjects. . . .

"The findings indicate that 10% or more bemegride in combination with barbiturates affords protection against the central depressant effects of the latter. In humans bemegride is a more effective antidote to the central depressant effects of phenobarbitone than to those of amylobarbitone and pentobarbitone. As a result of the ingestion of bemegride simultaneously with the barbiturate there is a delay in the onset of sleep, especially in those cases given a large dose of bemegride. . . . The treatment should not be given to persons with a known or suspected history of epilepsy."

Erspamer, V. and Glasser, A.: The pharmacological actions of murexine (urocanylcholine.) Brit. J. Pharmacol. & Chemotherapy 12: 176-184 (June) 1957.

"Murexine or urocanylcholine (B [imidazole - 4(5)] - acryl-choline) is a naturally occurring choline ester found in the hypobranchial body of some prosobranchiate molluscs, which might use it for defense or, more likely, for procuring food. Murexine was first isolated by Erspamer (1948); its chemical constitution was determined by Erspamer and Benati. . . . Sufficient quantities of the substance were made which permitted extensive pharmacological studies and a preliminary clinical trial. The present paper gives an account of these studies. . . .

"Both natural and synthetic murexine chloride hydrochloride . . . were used throughout the experiments. . . . A preliminary clinical trial of murexine was carried out by Deblasi and Leone . . . on 47 patients and by Ciocatto, Cattaneo and Fava . . . on 123 patients. Murexine proved to be an interesting short-lasting muscle relaxant, worthy of a more extensive clinical investigation. . . . Murexine caused several side-effects, which were mainly attributable to the nicotinic actions of the drug. . . .

"Murexine is one of the first neuromuscular blocking agents of animal origin to be chemically defined. It is highly probable that systematic studies in the field of invertebrates will lead to the discovery of the existence of murexine or closely related substances in other invertebrates. . . .

"In the absence of direct evidence, all the available experimental and clinical evidence suggests that murexine should be listed among the blocking agents acting by depolariza-

tion. . . . Among the known 'depolarizing' agents, the substance most closely related to murexine is suxamethonium. . . . More extensive clinical investigation is necessary to establish whether murexine can be employed as a safe and valuable muscle-relaxant drug."

Simmons, P. H. and Blanshard, May S.: An assessment of buthalitone sodium. Brit. M.J. 2: 1347-1350 (Dec. 7) 1957.

"There has been a reawakening to the need to have available in anaesthesia an alternative agent to nitrous oxide for short-duration anaesthetics, particularly for out-patients. This can be seen in the recent work of the cyclopropane protagonists . . . and in the revived interest in ultra-short-acting barbiturates other than thiopentone. . . . Buthalitone sodium is a thiobarbiturate first described in 1936 by Miller et al. . . .

"Some 200 out-patients attending for orthopaedic manipulation or minor surgery formed the main series. . . . From the results of this clinical trial it does not appear that buthalitone is an advance in out-patient anaesthesia. . . . The rate of recovery following the administration of buthalitone as compared with thiopentone—when giving equivalent anaesthesia—was found to show no statistically significant difference. In our experience hiccup was a frequent and troublesome sequel to induction. It marred a smooth induction and hampered manipulative surgery. This despite varying techniques of administration—namely, altering the rate of administration. The results with rectal administration to children made us cease after a limited series. Thus buthalitone does not show a more rapid rate of recovery, and also has certain properties which make us prefer the present available techniques and agents."

Wegryn, S. P. and Marks, R. A.: Promazine, meperidine, and spinal anesthesia for labor and delivery. J.A.M.A. 167: 1918-1921 (Aug. 16) 1958.

"Recently we have used a new technique in the control of labor. . . . In essence, it is the use of promazine (Sparine) intravenously during labor. . . . We set out to (1) evaluate the intravenous use of promazine in labor; (2) standardize our procedure; (3) evaluate the side-effects of promazine, especially the hypotensive reaction; and (4) equate these with the best welfare of mother and child in comparison with standard techniques. . . .

"Our statistics were based on 100 cases. . . . Promazine and meperidine in labor afford a method of analgesia and relaxation which appears superior and safer than other modalities in common usage. Ease of administration and minimal side-effects are of particular merit. The hypotensive effects of promazine and spinal anesthesia do not seem to be significant deterrents to their use. We encountered no clinical hypotension at any time with our methods."

Barbee, Grace C.: Changing nursing patterns produce changing professional liability patterns. Hosp. Management 86: 110; 112-114 (Aug.) 1958.

"If there are changing patterns in nursing, there will be changing patterns in legal aspects of nursing. . . . Violations of Medical Practice Acts can give rise to criminal prosecution of registered nurses. In considering this or any other phase of the legal scope of professional nursing, we must

look for grants of rights in Nursing Practice Acts; to prohibitions in Medical Practice Acts; and to court interpretation of both Acts. Certain procedures once deemed medical procedures have by attrition become accepted nursing functions without questioning; for example, giving injections. . . .

"Prior to 1936, the question of the day in California was the legality of a qualified nurse giving general anesthesia. The Medical Practice Act did not by specific reference prohibit the procedure. Yet a registered nurse was charged with violating the Medical Practice Act because she gave general anesthesia. . . .

"The Chalmers-Francis case decided the anesthesia question in California when it held: 1. Qualified registered nurses may give general anesthesia in California. 2. Such was the general practice. 3. The practice was in conformance with sound prevailing medical opinion. Provided, however, that it be performed under medical direction and supervision.

"In West Virginia the question was resolved by statutory change. A 1945 amendment to the West Virginia Code provides that a nurse can give anesthesia "in the presence and under the supervision" of a physician. This is specific legislation, which can become restrictive legislation. For it is a legal concept that where specific powers are enumerated, the powers not mentioned are deemed denied. . . .

"We must look to courts to use sound judgment in interpreting nursing laws in the light of the constant developments. Courts can do this if the nursing profession, their representatives, and their official publications make themselves known and interpret these changes to the courts."

Silver, Sidney: Nisentil and Lorfan in dentistry. J. Am. Dent. Soc. Anesthesiology 5: 9-12 (June-July) 1958.

"The present study was undertaken to evaluate the effectiveness of Nisentil with Lorfan in relieving pain during routine dental procedures. . . . The patients selected for this study were both hospital in- and out-patients. . . .

"Nisentil with Lorfan . . . was evaluated in a study of 186 cases. There was excellent analgesia in 97 per cent of the cases. The other 3 per cent needed more time to become analgesic. In the preliminary observations, nausea, vomiting and respiratory depression were frequently observed. In the final study, with controlled dosage, 3 per cent of the patients had cramps, stomachaches and some nausea, and 8 per cent were sleepy, but there was no respiratory depression.

"The drug provided prompt and effective analgesia of short duration (approximately two hours), which did not interfere with the patient's ability to cooperate. It relieved anxiety and pain and was an excellent supplement to local block anesthesia."

Lasagna, Louis: The newer hypnotics. M. Clin. North America, pp. 359-368 (March) 1957.

"Barbiturates are unquestionably the most popular hypnotic drugs—and with good cause. The two or three most popular barbiturates, when administered in appropriately individualized doses, can meet the somnifacient requirements of most insomniacs. If one adds chloral hydrate to the therapeutic cupboard, the question arises: Do physicians need the spate of new hypnotics coming their way via the pharmaceutical industry?

"Some of the new drugs [are] . . .

Dormison . . . Miltown, Equanil . . . Noludar . . . Valmid . . . Doriden . . . Placidyl . . . Trichloroethanol . . . [and] across - the - counter hypnotics [such as] . . . Dormin, Nytol, Sleep-Eze. . . . Almost all these preparations contain as their primary ingredient an antihistaminic compound, methapyrilene. . . . Only further data will enable physicians to estimate the relative merits and dangers of these over - the - counter hypnotics when compared with prescription drugs. . . .

"The major contribution made by the newer (and more expensive) nonbarbiturate hypnotics has been to provide the doctor with a number of varyingly effective drugs which can be tried in the event that a patient is unable to tolerate barbiturates or chloral hydrate. The evidence to date provides no compelling reason for believing that any of the newer hypnotics differ qualitatively from barbiturates in their desirable or undesirable attributes."

Nicholson, M. J. and Orr, R. B.: Fire and explosion hazards in the operating room. S. Clin. North America, pp. 783-801 (June) 1957.

"Fires and explosions have occurred in conjunction with the use of flammable anesthetics since their introduction. These accidents are relatively rare, occurring, according to available statistical reports from one to four times per 100,000 administrations. . . . Extensive basic research into the cause and prevention of these tragedies, carried on at the Massachusetts Institute of Technology, Explosive Division of the Bureau of Mines, Mellon Institute and the Bureau of Standards, has brought us a long way toward an understanding of this complex problem. The role of the National Fire Protection Association

TIMELY REPORTS . . .

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in bringing together at frequent intervals all interested groups has continued to improve the Code of Recommended Safe Practices for Hospital Operating Rooms. . . .

"Although all available precautions are taken, it is practically impossible to maintain an iso-electric state (same potential) for everything in the operating room. It is, therefore, the duty of the surgeon, anesthesiologist, nurses and other operating room and delivery room personnel to be thoroughly instructed in all of the causes of anesthetic fires and explosions. The most important factor in safety is building an attitude in the staff that is alert to the hazards and recognizes personal responsibility for the safety of all patients. Safety cannot be legislated into the surgeon-patient relationship. Young persons and junior members of the staff are cooperative and readily extend their concept of patient care. Careless disregard for such refinement may be frequent among the senior members and administrators. These groups have employed current practices so often that they feel exempt from electrostatics as a source of ignition and feel that fires and explosions do not occur often enough to warrant taking precautions."

Book Reviews

THE RECOVERY ROOM. A SYMPOSIUM. By John Adriani, M.D., Professor of Surgery, School of Medicine, Tulane University; Clinical Professor of Surgery and Pharmacology, School of Medicine, Louisiana State University; Professor of General Anesthesia, School of Dentistry, Loyola University of the South; Director, Department of Anesthesiology, Charity Hospital of Louisiana, New Orleans, and John B. Parmley, M.D., Instructor in Surgery, School of Medicine, Tulane University; Director, Department of Anesthesia, Hotel Dieu; Visiting Anesthesiologist, Tulane Unit, Charity Hospital, New Orleans. Springfield, Ill. Charles C Thomas. 1958. $4.25.

Drs. Adriani and Parmley have assembled important data in the form of a symposium based on their experiences in discussions of the recovery room.

The authors have presented some of the many questions asked concerning recovery room management, and opinions from some of the leading authorities in the field of anesthesiology, surgery, nursing, and hospital administration.

Illustrations are included to demonstrate the equipment necessary for the proper care of the patient. The chapters on General Patient Management and Management of Special Problems will be of particular interest to the anesthetist.

This monograph is another in the American Lecture Series and will be exceedingly useful to anesthetists and others planning a recovery room, as well as those persons who are already engaged in the function of a recovery room. Indexed.

ANATOMY AND PHYSIOLOGY FOR NURSES. By W. Gordon Sears, M.D. (Lond.), M.R.C.P. (Lond.), Physician Superintendent, Mile End Hospital, London; Examiner to the General Nursing Council for England and Wales. Baltimore, Maryland: The Williams and Wilkins Company. Cloth. 376 pages. 1958. $3.50.

In the third edition of this text a number of new figures and diagrams have been added. Dr. Sears has presented in a concise manner the essentials that must be known to anyone who practices nursing.

Written for nurses it will be of special interest to anesthetists who are concerned with teaching. Questions follow each chapter. Indexed.

PRACTICAL BLOOD TRANSFUSION. By J. D. James, M.R.C.S., L.R.C.P., Director, North London Blood Transfusion Service. Foreword by P. L. Mollison, M.D., F.R.C.P., Director, Medical Research Council's Blood Transfusion Research Unit; Lecturer in the Department of Medicine, Postgraduate Medical School of London. Springfield, Illinois: Charles C Thomas, Publisher. Cloth. 187 pages. 1958. $4.50.

Dr. James has presented special chapters on the subjects of the Transfusion Service, the Organization of a Hospital Blood Bank, Open Heart Surgery, Contamination of Blood, and the Legal Aspects of Transfusion work. The author has for many years directed one of the largest centers of the National Transfusion Service.

This book will be invaluable to all physicians and anesthetists who are concerned with transfusions. References follow the text. Indexed.

Handbook of Cardiology for Nurses. By Walter Modell, M.D., F.A.C.P., Associate Professor, Cornell University Medical College; Attending Physician, New York Veterans Administration Hospital; Associate Attending Physician, Bellevue Hospital, and Doris R. Schwartz, B.S., R.N., Assistant Professor, Cornell University-New York Hospital School of Nursing; Public Health Nursing Coordinator, Comprehensive Care and Teaching Program, The New York Hospital-Cornell Medical Center. New York, N. Y.: Springer Publishing Company, Inc. Cloth. 328 pages. 3rd ed., 1958. $4.50.

The third edition of this valuable text follows the second edition by four years. Since the publication of the second edition a number of drugs have been introduced and the scope of cardiac surgery has greatly expanded.

The authors have made extensive revisions to bring these aspects of the volume up to date. A new chapter has been added on Nursing Care Before and After Cardiac Surgery.

Nurse Anesthetists will find the entire subject of interest. There are special parts, such as those on the Drugs and Surgery in the Treatment of Heart Disease that will be of particular interest. Indexed.

Modern Trends in Anesthesia. By Frankis T. Evans, M.B., B.S., F.F.A.R.C.S., D.A. and T. Cecil Gray, M.D., F.F.A.R.C.A., Reader in Anaesthesia, University of Liverpool. New York, N. Y.: Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers. Cloth. 331 pages. 1958. $15.00.

In this volume, the authors have presented an entirely new type of review. A wide area of theory as well as practice is covered. Contributions are made from authorities in the various fields of medicine.

Among the subjects included are: Pharmacology of New Drugs, New Conceptions of Consciousness, Hypothermia, Cardio-Respiratory Pumps, The Pituitary Adrenal System and Anesthesia, and Hypnosis.

These recent thoughts and trends in anesthesia will be of special interest to the practicing anesthetist. References follow each chapter. Indexed.

The TWENTY-NINTH QUALIFYING EXAMINATION for membership in the American Association of Nurse Anesthetists will be conducted on May 9, 1959. The deadline for accepting completed applications including the transcripts is March 30. Notice of eligibility will be mailed about April 12.

Applications should be forwarded early enough to allow time to request transcripts and have them returned to the Executive Office before the deadline date.

The THIRTIETH QUALIFYING EXAMINATION for membership in the American Association of Nurse Anesthetists will be conducted on November 14, 1959. The deadline for accepting completed applications including the transcripts is October 5. Notice of eligibility will be mailed about October 12.

Applications should be forwarded early enough to allow time to request transcripts and have them returned to the Executive Office before the deadline date.

Hospital Safety . . .

(Continued from page 56)

floor. This of course, would defeat the devices made available to help provide safety from explosions in the presence of flammable anesthetics.

Outer garments and undergarments with free hanging skirts, such as slips or petticoats, must be of textiles with natural high hygroscopic qualities which reduce electrostatic accumulation. These clothing requirements apply to each and every person entering areas where flammable anesthetics are used.

Legislation . . .

(Continued from page 61)

such notation cannot, in itself, create or support a claim of negligence under the present circumstances. When the fragment was removed the X-rays and the X-ray report showing the presence and removal were made part of the hospital records. We find that no negligence was established in connection with the needle episode.

Finding no error, the judgment for defendant, based upon the directed verdict, was affirmed.

(Williams v. Chamberlain, 8 CCH Neg. Cases 2d 886-Mo.)

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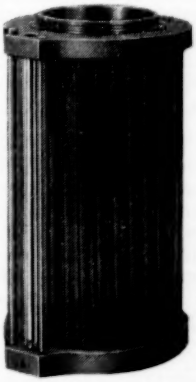

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NURSE ANESTHETIST WANTED. Good salary. Excellent working conditions in 55 bed hospital that is planning an expansion program in the near future. Located near Philadelphia, Pa. Applications may be sent to Doylestown Hospital, Doylestown, Pa., c/o Pauline B. Young, Superintendent.

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NURSE ANESTHETIST: Immediate openings in fully accredited 300 bed general hospital for Nurse Anesthetist in city of 55,000 and serving area of 300,000 population. Paid vacation and sick leave, social security and group hospitalization available. Reply stating education, experience, and salary requirements to Assistant Director, Lima Memorial Hospital, Lima, Ohio.

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REGISTERED NURSE ANESTHETIST. Excellent working conditions in modern 132-bed hospital. Friendly community with two colleges. Beginning salary $500 plus call pay. Apply Ralph B. Bersell, Administrator, Passavant Memorial Area Hospital, Jacksonville, Illinois.

NURSE ANESTHETIST — 150 bed hospital — suburban community north of Chicago on shore of Lake Michigan. New surgery and other facilities under construction. Department of four nurse anesthetists under an M.D. anesthetist. $450 minimum salary. Merit raises. Good living facilities. For further details write Personnel Director, Highland Park Hospital Foundation, Highland Park, Ill.

ANESTHETISTS: Both staff and student positions available; 647 bed general hospital in college city; large variety of surgical and OB cases; all agents and techniques used and taught; hospital also conducts fully approved training for medical students, interns, residents, medical technologists, X-Ray technicians, and a school of nursing; housing and a stipend paid to students; staff anesthetists may start at $6344 annually. Apply, Personnel Director, Hurley Hospital, Flint, Michigan.

NURSE ANESTHETIST: 40 hour week — New O.R. Dept. — Anesthesiologist Supervisor. Write to Anesthesiologist Supervisor, Evangelical Deaconess Hospital, 3245 E. Jefferson, Detroit 7, Mich.

NURSE ANESTHETIST: 240 bed hospital. Start $5220 - $5580 annual based on experience. Staff — 5 AANA anesthetists plus anesthesiologist in charge. Good Personnel Policies; Retirement Program in addition to Social Security. Centered in beautiful Allegheny Mountains 60 miles east of Pittsburgh. Contact: Personnel Director, Mercy Hospital, Johnstown, Pa.

ANESTHETISTS, Two, Certified, Registered preferred. For 275 bed hospital in Danville, Virginia. Five Nurse Anesthetists and a Medical Anesthesiologist already in the Department. Complete maintenance, Social Security. Salary open dependent upon experience. Write or call William J. Lees, Administrator, The Memorial Hospital, Danville, Virginia.

WANTED: NURSE ANESTHETIST, 38 bed General Hospital. Arrangements made for alternating call. Salary open. Contact Superintendent, Red Wing City Hospital, Red Wing, Minnesota.

ANESTHETISTS, Two, for work in Negro Hospital, Salary open. Light surgical schedule. No schedule on Saturday or Sunday. No Obstetrical call, few night calls. Department under supervision of White Medical Anesthesiologist. Write or call William J. Lees, The Memorial Hospital, Danville, Virginia.

WANTED: Registered Nurse Anesthetist in Oral Surgeon's Office. No evening hours or night calls. A five (5) day work week. Beginning salary of $400 per month with opportunity for advancement. Please furnish educational background, age, marital status, etc. in original communication. Marvin E. Pizer, D.D.S., M.S., Hunting Towers, East — Suite 131, Alexandria, Va.

NURSE ANESTHETIST wanted for a 70-bed general hospital. $500. per month, 5½ day week, 2 weeks paid vacation, sick leave, meals and launder of uniforms. Please contact the Administrator of Memorial Hospital, Dumas, Texas.

NURSE ANESTHETIST: Starting salary for A.A.N.A. member $415 per month with three annual increases of $15 per month to $460 per month after three years. Starting salary if not member of A.A.N.A. $380 per month increased to $415 per month after accepted as member of A.A.N.A. Also included: laundry, private room with bath and telephone in new women's residence or $27 per month allowance if living out; Social Security; pension plan; 40 hour week including full time credit for first call, second call paid for cases done; six paid holidays; 30 days annual vacation; liberal sick leave policy. Apply Marshall Kerry, M.D., Chief Anesthesiology, The Reading Hospital, Reading, Pa.

WANTED: Registered Nurse Anesthetist for an accredited 450 bed general hospital, located in a beautiful university town. Social Security, annual vacation and sick leave benefits. Salary according to experience. Please contact Sister Mary Xavier, Superintendent, St. Joseph Mercy Hospital, Ann Arbor, Michigan.

NURSE ANESTHETIST to complete staff of five for 260 adult bed hospital, expanding to 500 soon, located near business district, Akron, Ohio. Surgery and OB. No call except relief. Forty hour week, extra for over-time. Four weeks vacation after year. Base pay after boards $450.00, qualifications and experience govern salary offer. Apply: Administrator, St. Thomas Hospital, 444 N. Main St., Akron, Ohio.

FOURTH ANESTHETIST needed for attractive position in modern 112 bed fully accredited hospital. Active surgical schedule. Starting salary $114.40 weekly. Liberal yearly increases. Numerous employee benefits. Pleasant living in small community environment. Commuting time — 10 minutes per day. Rentals low. Write Alan B. Campbell, Administrator, Richland Memorial Hospital, Olney, Illinois.

NURSE ANESTHETISTS (2)—One each for Surgery and Obstetrics. Basic 40 hour week. Salary to $550.00 per month. Overtime pay. Vacation benefits to four weeks annually. Sick benefits in cash payment. Pension retirement. Write Personnel Department, St. Joseph Mercy Hospital, 900 Woodward Ave., Pontiac, Michigan.

NURSE ANESTHETIST — For 490 bed general medical and surgical hospital. Excellent surgical staff. Personnel policies include 30 days annual leave, 15 days sick leave, 8 holidays. Share work with 3 other well qualified nurse anesthetists. Salary range $5205.00 to $7030.00 depending on qualifications. Non-housekeeping quarters available. Other benefits are annual salary increases, life insurance at low rates and an excellent retirement plan. Contact: G. A. Higgins, M.D., Chief of Surgery, Veterans Administration Hospital, 4801 E. Linwood Blvd., Kansas City 28, Missouri.

TWO ANESTHETISTS needed early 1959. Also OB Anesthetist either p.m. or night shift. Expanding program. New wing with new surgery and additional beds completed early summer. Active surgical and obstetrical services. Income approximately $500.00, amount depending on training and experience. Medical Anesthesiologist in charge. Good Personnel Policies. Contact Director of Anesthesia, Methodist Hospital, Peoria, Ill.

ANESTHETIST - NURSE. Must be fully qualified and experienced with all types of anesthesia. Suburban community hospital 15 miles from downtown Pittsburgh. Contact Director of Personnel, Sewickley Valley Hospital, Sewickley, Pennsylvania.

ANESTHETIST in 280-bed GM&S Training Hospital. Require graduate of approved school of anesthesiology. Salary range $5205 to $9530 per annum. Write J. Melvin Boykin, M.D., Manager, VA Hospital, Lincoln, Nebraska.

This 185 bed general, non-profit, nonsectarian community hospital fully accredited by the Joint Commission on Accreditation and approved for internships by the American Medical Association, needs a nurse anesthetist. The total annual pay exceeds $6,000. per year. The staff of anesthetists consists of three nurse anesthetists fully qualified and are required to be either members of the AANA or eligible. The department is well equipped, and Heidbrink anesthesia machines are in use. Call is taken every third night and every third weekend, and additional payment is paid for each major case. Three weeks paid vacation, plus six paid holidays, plus sick time allowances are offered. The hospital is located in a resort city of 50,000 on Lake Michigan. Apply to Administrator Mr. C. T. Loftus, Mercy Hospital, Benton Harbor, Michigan.

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WANTED: Nurse Anesthetist for old established group, attractive salary, paid vacation and sick leave, excellent working conditions. Write The Sugg Clinic, 100-106 E. 13th St., Ada, Oklahoma.

NURSE ANESTHETIST — 140 bed general hospital—Two anesthetists staff —rotating call. Starting salary $487.00. Excellent working conditions and personnel policies. Modern living accommodations. Apply: Director of Nursing, Central Maui Memorial Hospital, Wailuku, Maui, Hawaii.

NURSE ANESTHETISTS — Excellent working conditions in new remodeled 425 bed hospital. Starting salary up to $500 depending on qualifications. Extra pay for duty above 40 hours per week. Call duty 1 night per week. Semiannual guaranteed increase. Good fringe benefits. Department under direction of 2 M.D. Anesthesiologists. Apply Personnel Director, St. Joseph Hospital, Fort Worth, Texas.

NURSE ANESTHETIST Salary $487.50 to $541.67 per month plus liberal fringe benefits. Case compensation for overtime. Easily make $750.00 per month. Apply Director of Anesthesia, Pontiac General Hospital, Pontiac, Mich.

WANTED: Nurse Anesthetist in 65-bed general hospital expanding to 104 beds. Located in an exclusive suburb of Chicago. Chicago North Shore and Milwaukee and Chicago and North Western trains serve the community. Modern Anesthesia equipment, Good salary, Living quarters available, Four weeks vacation, Other benefits. Apply: Personnel Director, Lake Forest Hospital, Lake Forest, Illinois.

ANESTHETIST WANTED — 118 bed general hospital. Approximately 2000 operations and 700 deliveries annually. All surgery done by Board Certified specialists. Anesthetist will be one of three providing anesthesia to all surgical and obstetrical patients; also participate in recovery room care. Starting salary $6200 including call in fees with annual increments. Four weeks vacation, sick leave, retirement plan, paid holidays. Warsaw is a village of 4000 population situated in the picturesque Wyoming Valley. One hour's drive to either downtown Buffalo or Rochester. Write Administrator, Wyoming County Community Hospital, Warsaw, New York.

NURSE ANESTHETIST — 125 bed general hospital. Two Anesthetist staff-rotating call, no O.B. call, very little week-end call. Apply: Sister Superior, St. Joseph's Hospital, Aberdeen, Washington.

WANTED: Registered nurse anesthetist for 150 bed accredited hospital. Four other nurse anesthetists employed full time. Starting salary $475.00, increase to $500.00 after six months with further increment increases. Forty hours per week, two weeks paid vacation and six paid holidays per year, 100 physicians on medical staff including all specialties, hospital expansion program now being planned. Write Robert D. Howe, Administrator, Billings Deaconess Hospital, Billings, Montana.

NURSE ANESTHETIST—Suburban Philadelphia Hospital. Excellent living and working conditions. 7 on staff, 2 Anesthesiologists. Apply Director of Anesthesiology Department, Abington Memorial Hospital, Abington, Pa.

WANTED Nurse Anesthetist for air-conditioned, fully approved, 200-bed hospital in Connecticut community of 50,000—no afternoon operating schedule, little obstetrics, 4 weeks vacation per year, salary dependent on qualifications. Apply: Administrator, Bristol Hospital, Bristol, Connecticut.

NURSE ANESTHETIST: Female, for Medical School, 1000 bed teaching hospital. Permanent position. Liberal salary, vacation and personnel benefits. Forty hour week. Apply: H. M. Hoff, Associate Director, Jackson Memorial Hospital, Miami, Florida.

NURSE ANESTHETIST: 190 bed general hospital with new complete operating room suite needs additional surgical-obstetrical anesthetist. Salary $450-$500 plus additional for rotating call. Town of 40,000 on Lake Huron and St. Clair River, 58 miles North of Detroit. Apply: Administrator, Port Huron, Michigan.

WANTED: Anesthetists to bring department to 3 in 125 bed hospital. Salary $500 up depending upon qualifications. A months vacation, light schedule, and pleasant personnel. For information contact Director of Nurses, St. Mary's Hospital, Roswell, New Mexico.

WANTED: Nurse Anesthetist. Salary open. Apply Charles H. Gillespie, M.D., Scott and White Memorial Hospital, Temple, Texas.

ANESTHETIST WANTED City of 100 lakes near Cypress Gardens to complete staff of four in 150 bed hospital. Starting salary $550.00. Contact Thomas Richards, Head Anesthetist, Winter Haven Hospital, Winter Haven, Florida.

ANESTHETIST: Male or Female—For medium-size hospital. Excellent working conditions. Salary $450 to $500 month depending on experience. Minimum call. Send resume to Personnel Office, Lawrence and Memorial Hospital, Now London, Connecticut.

NURSE ANESTHETIST — 100 bed accredited Hospital. Excellent working conditions and personnel policies. New Hospital under construction. Salary $450.00-$500.00. Write Miriam P. Savage, St. Mary's Hospital, Green Bay, Wisc.

REGISTERED NURSE ANESTHETISTS: Immediate openings for permanent employment. 670 bed hospital. Exceptional opportunity for well trained Nurse Anesthetist in active operating room suite. Apply: Personnel Director, Harper Hospital, Detroit 1, Michigan.

NURSE ANESTHETIST: Immediate opening for 1 Anesthetist to complete a staff of 4 in a large group of 20 Doctors. No obstetrical call. Paid vacations. Starting salary commensurate with experience and ability. Apply to Personnel Director, Christie Clinic, 104 W. Clark, Champaign, Illinois.

ANESTHETIST, Nurse, Registered, Female, by June 15, 1959. To serve also as chief Nurse and Supervisor. $600.00 monthly. Supervisory experience desirable. 12 bed general hospital in mining town; staff of 20, including 7 RN's. Must be adept at inhalation, intratracheal, spinal, and intravenous techniques, and capable of independent judgement. Age under 50 years. Employment for husband usually available. Good school, low rental housing, excellent climate. Write: Richard G. Hardenbrook, M.D., Bagdad Hospital, Bagdad, Arizona.

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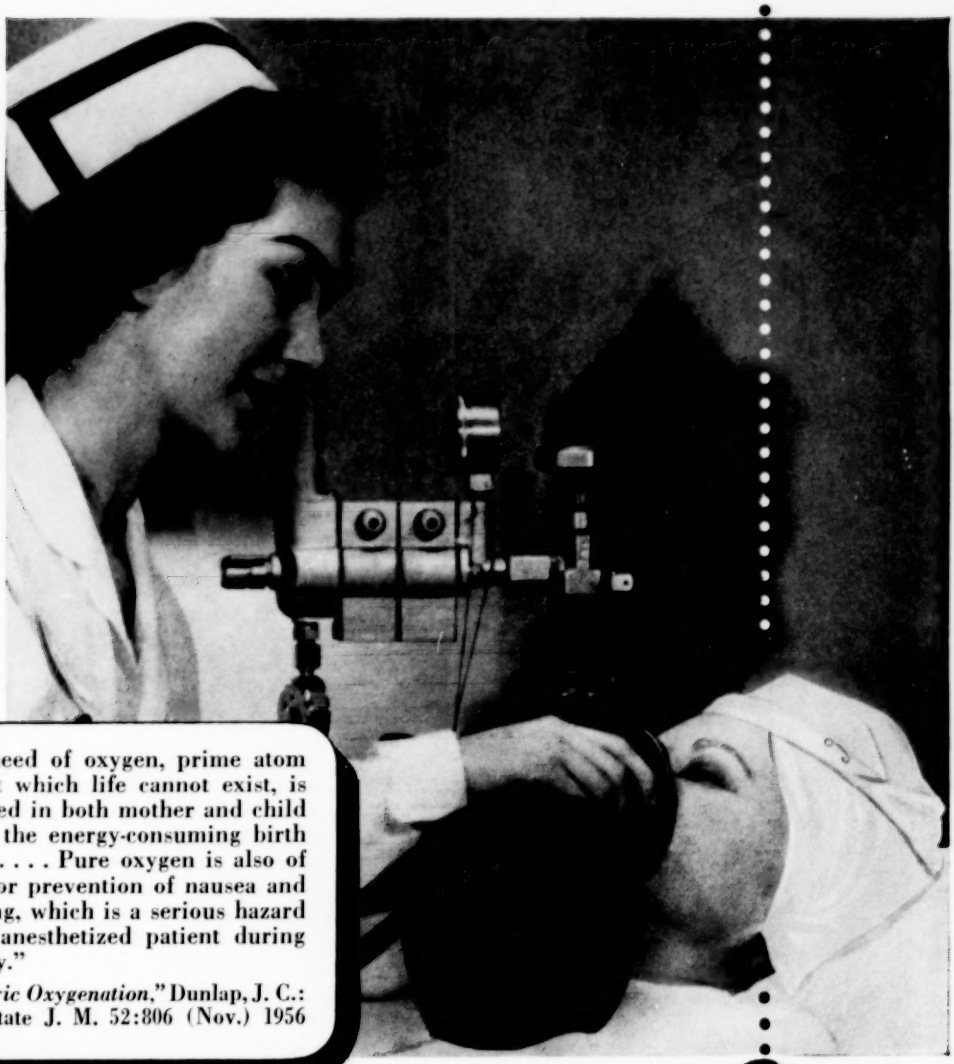

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